# ARCHIVES

OF

# OPHTHALMOLOGY

*EDITED IN ENGLISH AND GERMAN*

BY

DR. H. KNAPP
OF NEW YORK

AND

DR. C. HESS
OF WÜRZBURG

DR. W. A. HOLDEN
OF NEW YORK
ASSISTANT EDITOR

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# ARCHIVES OF OPHTHALMOLOGY.

## THE AFTER-EFFECTS OF ESCAPE OF THE VITREOUS[1]

### During the Operation of Extraction of Cataract in the Capsule, by Smith's Operation.

By Capt. A. E. J. LISTER, M.B., B.S. (Lond.), F.R.C.S. (Eng.), I.M.S.

IN the various discussions which have taken place, from time to time, as to the advantages and disadvantages of this operation, it has been contended, by the opponents of the operation for the extraction of the cataract in the capsule, that one of the chief objections to this operation is the frequency of the escape of vitreous. This being the only complication which is at all frequent, and the one which is most commonly met with by beginners in this operation, I inquired from Major Smith on my arrival in Jullundur in 1906 if any series of cases had ever been published, in which the after-effects of escape of vitreous in this operation were given. Major Smith informed me that, as far as he was aware, no such series of cases had ever been published, either after this, or the capsulotomy operation.

I then offered to undertake a research into the subject and received permission from Major Smith to make every use of his hospital records, which were placed at my disposal for this purpose.

Every assistance was rendered me by Major Smith, whom press of work alone had prevented from carrying out this work before. Many thousands of cases in the operation

[1] Read at the Bombay Medical Congress, 1909.

books were gone through and the names of patients, in whose eyes escape of vitreous had occurred, were noted. Each patient was then written to, and of them 95 presented themselves for examination. In certain of the tables it will be seen that the amount of vitreous and the remarks made at the time of operation are not given. The reason of this is, that in the operation book a note only was made of the fact that vitreous had escaped; the details are noted by Major Smith on the patients' tickets always under four headings:

(i) Drop = 2 to 4 minimums
(ii) Trace = 4 to 5 "
(iii) Slight = 5 to 10 "
(iv) Some = 10 minimums to one-third of the vitreous.

The cases will be found classified in the tables appended under these headings.

As the cases went back as far as nine years, it is not surprising, considering the many thousands of hospital tickets there were, that all the tickets could not be found. Native patients are very apt to take the ticket home with them when they go, and in a large hospital with many hundreds of patients and a very small staff, such as there is at Jullundur, it is not always possible to prevent this. Some patients being satisfied with their condition do not wait to be discharged but depart, taking the tickets with them. These facts will be well known to surgeons in India, but they are mentioned to make the matter clear to any who do not know India. Three were found to have had escape of vitreous in both eyes, so the number of eyes examined was 98. In 90 of these cases, no portion of the capsule of the lens was found to remain; in eight a portion of it or the whole was found to be present.

## Method of Examination.

The vision of the patients was tested by Snellen's test types, if they were able to read; in the case of those unable to read, who formed the bulk of the cases, by groups of dots, which they were asked to count. Special test cards, with dots of various sizes, corresponding to Snellen's distant test types, were kindly supplied for this purpose by Messrs.

Lawrence and Mayo of Calcutta. I found it more convenient to cut out various groups of dots, and to mount them on cardboard, one or two for each corresponding line of Snellen's test types. When dealing with patients lacking in education and advanced in years, this plan will be found an advantage. I have many times tested the results given by the same people when asked to read the Snellen's test types. I find that on the whole the dots are slightly the harder test of the two, so that all the results given may be taken as absolutely correct.

I found the use of these dots more convenient than Landolt's optotype, which I also used for some cases. At first I endeavored to test the vision with the glasses found by determining the refraction of each case by retinoscopy. I found after doing a number of cases that the astigmatism was scarcely ever over one diopter, so to save time I gave up doing a retinoscopy in every case, and gave them the plus lens they preferred, which in almost every case was a plus ten diopter lens. The excellent results obtained proved the correctness of my observations, as the results obtained were all without the use of cylindrical lenses. I have noted, in the column of remarks, the cases in which a spherical lens other than + 10 D. was preferred.

The patients in most cases insisted on returning the day they arrived, so that on account of press of work I was unable to do a retinoscopy in the majority of the cases. As excessive astigmatism has been alleged to be caused by this operation, it may be well to call special attention to these facts. I have also observed a number of cases in which escape of vitreous had not occurred, and I found that in them also the average astigmatism was one diopter. Owing to enforced absence on several occasions, twenty-five of the cases were kindly examined for me by Major Smith. I had also the advantage of the opinion of Major Smith on the few cases in which disease of the fundus was present, which will be mentioned later. The chief facts revealed by this research are as follows:

The total number examined was 98; in no case was any detachment of the retina present. Disease of the fundus was found to be present in 8 eyes. A detailed account of these is given elsewhere in this paper. The exact time, which had

elapsed since the operation, was known in every case. It averaged 3.706 years.

The different periods since the time of operation ranged from six months to nine years.

### Vision of Cases.

Tables will be found at the end of the paper giving the exact vision of each case, with one exception, in which by an oversight I forgot to note it at the time of examination. It may be wondered why the vision of the cases in Table A do not quite correspond with those in Table B, being in the form shown chiefly as $\frac{6}{6}$; the answer is that at first I did not test a patient further if he had a vision of $\frac{6}{6}$. Later, when I found what excellent vision they had, I endeavored to estimate it exactly. It will be noted that the average standard of vision is very high indeed; thus in 61 cases in which there was no opacity of the cornea, capsule left behind, or disease of the fundus, it will be found that the vision was as follows:

$$\frac{6}{3} = 4,\ \frac{6}{3{\cdot}5} = 6,\ \frac{6}{4} = 4,\ \frac{6}{4{\cdot}5} = 5.$$

$$\frac{6}{5} = 4,\ \frac{6}{6} = 33,\ \frac{6}{8} = 2,\ \frac{6}{9} = 3.$$

I may remark here that I find in India, owing to, I think, the better light and clearer atmosphere, the patients who come to me for examination usually read a line or two more of the Snellen's test types than they do in England. I find very many British soldiers read $\frac{6}{3{\cdot}5}$ quite readily. This may account to a certain extent for the excellent vision of these cases, but it is not the chief reason, which is the absence of an after-cataract, leaving a perfectly free pupil, and also the low degree of astigmatism. An important question is, Does the amount of vitreous lost exercise a marked effect on the vision obtained by the patient? The figures at my disposal are too small to admit of any definite conclusion, but they indicate, as far as they go, that it does not have any marked influence. Thus we find in five cases in which the largest amount of vitreous was lost, the vision was:

$$\frac{6}{3},\ \frac{6}{5},\ \frac{6}{6},\ \frac{6}{6},\ \text{and}\ \frac{6}{9}.$$

Taking six cases classed as Trace and Slight, we find the vision to be $\frac{6}{3}$, $\frac{6}{3{\cdot}5}$, $\frac{6}{5}$, $\frac{6}{6}$, $\frac{6}{8}$, $\frac{6}{9}$. The number of cases is far too small to be conclusive, but they are sufficiently striking to point out the need of further investigation on this point. Thus it does not appear from these cases that the amount of vitreous lost, provided that the eye recovers from the immediate result of the operation, is the important factor in determining the ultimate vision of the patient.

I repeat that the number of cases is too small to be conclusive, but they are sufficiently striking to call for further investigation. Those operators who have observed cases in which a large amount, *i. e.*, more than one-third of the vitreous has been lost, will have noticed that the vision of such patients is often much worse at the time of leaving hospital than the vision of those patients in which a smaller amount has been lost. I have had the opportunity of observing these patients in a number of cases after leaving hospital, and have come to the conclusion that the vision of these patients is eventually much better than one might expect at the time of their leaving hospital; this observation is in accordance with the above facts, and will be of interest to those who may be intending to adopt the operation of extraction in the capsule. I think it is due to the greater distortion of the cornea which results temporarily, and to the fact that the normal tension and conditions of circulation and nutrition of the eye take longer to be re-established after loss of the vitreous, than when it is not lost. I have noticed this to be particularly the case in very old and feeble patients. This fact may have led ophthalmologists who have not had the opportunity of seeing the number of cases in which escape of vitreous has occurred, at a time when the eye has had sufficient time to completely recover, to regard escape of vitreous as more serious than this paper tends to prove it to be.

### Cases in which Disease of the Fundus was Present.

In 8 eyes of the 98 cases examined, disease of the fundus was found to be present. It may be of use to future observers to mention these in detail. They will be found in Table E. I will proceed to make a short comment on each:

Case 1, Table E.—Is one of syphilitic disease of the fundus and needs no comment.

Case 2, Table E.—Presents the ordinary history and signs of malarial optic neuritis. I have seen many cases with a similar history and fundus condition. Major Smith says it is quite common in the Punjab, and my smaller experience coincides with this.

Case 3, Table E.—Is an ordinary case of disseminated choroiditis. As it was present in both eyes, and escape of vitreous only occurred in the right eye, it cannot fairly be attributed to escape of vitreous. To discuss the question fully as to whether the condition of the fundus was caused by the extraction of the lens in its capsule, as may be suggested by the opponents of this operation, is beyond the scope of this paper. I will only say in passing I do not think it was. Disseminated choroiditis is so commonly seen in the Jullundur clinic, that I do not see any reason to connect it with the operation.

Cases 4, 5, and 6.—These were all cases in which the lens had been previously "couched" and presented the typical appearance of the condition, which always follows couching of the lens. This condition has been described fully in the medical press by Major Smith. It is interesting to note, however, that apparently in some cases at least removal of the lens does not prevent the progress of this serious condition.

Case 7.—Is a case of bilateral optic atrophy. Escape of vitreous occurred in one eye only, so it could not have been the cause of the condition in one eye, and it is reasonable to assume it did not cause it in the other.

It may be said that the optic atrophy was caused by the operation for extraction of cataract in the capsule, in both eyes. The disease is such a common one in the Jullundur clinic in old men, that I think it is quite as reasonable to say it was unconnected with the operation as with it. This matter needs a separate investigation. It should however be noted here, in connection with this and the preceding case, that Major Smith always extracts a cataract if there is any hope of improving the vision for a time, and that the condition may have been present in its earliest form at the time of operation.

In Case 4, the condition may possibly have been caused by the escape of vitreous, but when the fact that the eye was operated on five years before and that the vision was $\frac{6}{18}$

when seen, is taken into consideration, and that in no other case in the series has any effect been proved to have followed escape of the vitreous, it is quite as likely to have had another cause.

On examining these cases critically it will appear that only in Case 3, Table E, escape of vitreous may be a factor.

This condition, however, I have seen so commonly in the Jullundur clinic that I do not regard it as being due to loss of vitreous. Major Smith shares this opinion. I, however, leave the truth of this opinion for other observers to prove or disprove. It may be argued that some of these conditions may be due, if not to loss of vitreous, to the disturbance of the eye following the extraction of the cataractous lens in the capsule. This argument, I think, can only be advanced as regards Cases 3 and 4; optic atrophy and disseminated choroiditis are very common conditions in patients attending the Jullundur clinic, and I regard these cases as attributable to ordinary causes, but on this point also further investigation is required. We arrive, therefore, at the conclusion that of the series of 98 eyes examined one case of retinal degeneration may possibly be due to loss of vitreous, or to the operation of extraction of the cataractous lens in the capsule, or to a combination of the two, and that one case of optic atrophy and one of disseminated choroiditis may possibly be due to extraction of the cataractous lens in the capsule. If we take the escape of vitreous occurring during this operation as being about 5 to 6 per cent. in the hands of skilled operators, and allow that one case out of every 98 in which this accident happens develops subsequent disease of the fundus, we arrive at the conclusion that loss of vitreous in this operation, provided the eye recovers from its immediate effects, is not the serious complication which it at first sight appears. It is interesting to note that this is the opinion arrived at by Major Smith some years ago from a general experience of these cases, apart from any definite research in this subject.

It is specially interesting to note that detachment of the retina, the condition so generally feared as liable to occur after escape of the vitreous, did not occur in a single case. I suggest in conclusion that those ophthalmologists who state

that loss of vitreous is such a serious accident in cataract operations have been guided by the facts as known to them in operations other than those in which cataractous lens is extracted in its capsule. It is quite probable that the eye in these operations hampered with débris and the capsule of the lens, which apart from those cases in which definite iritis occurs must usually cause some degree of irritation, does suffer more serious damage, when loss of vitreous also occurs, than does the eye which is free from any irritating material. The fact that in the eight cases in which capsule was left there was disease of the fundus is interesting, but it should be remarked that in only one case was there a large amount of capsule, *i. e.*, Case 10, Table C—the other cases having only a small amount, as Major Smith always endeavors to remove as much of it as possible. On account of having a large wound, it is possible to remove most of the débris, so that the condition in these cases was not quite the same as in the ordinary capsulotomy operation.

Having regard to the facts given here, I maintain that, though the number of cases is far too small to be conclusive, it is sufficiently large to make us hesitate before we accept any conclusions formed by ophthalmologists, who do not extract cataract by Smith's operation, as to the seriousness of loss of vitreous in this operation. Further investigation will doubtless throw more light on this important subject. I repeat, however, let us be careful before we accept any dicta by any ophthalmologist, however distinguished he may be, on this important subject, unless supported by a series of cases, by an account of the operation performed, especially a statement as to whether the capsule was left behind or not, and if iritis or iridocyclitis followed.

TABLE A.

Showing—

(1) Number of years since the operation.
(2) Vision.
(3) Amount of escape of vitreous.
(4) Astigmatism.
(5) Remarks noted on case sheet at time of operation.

(6) Notes on points of interest in brackets in last column.

Number of cases—36.

| Number. | Name. | Years since operation. | Vision. | Amount of escape of vitreous. | Astigmatism. | Remarks at time of operation. |
|---|---|---|---|---|---|---|
| 1 | Khara ... | 5 | | Trace ... | ... | Iridectomy. |
| 2 | Akho ... | 4 | | " ... | ... | Iridectomy. "Very nervous." |
| 3 | Harnam Singh ... | 5 | | " ... | ... | Iridectomy. Lens lifted on spoon. |

| Number. | Name. | Years since operation. | Vision. | Amount of escape of vitreous. | Remarks at time of operation. |
|---|---|---|---|---|---|
| 1 | Kara ... | 6 | | Slight ... | Slight escape of vitreous. No iridectomy. He shot out lens and some vitreous on completion of incision from nervousness. |
| 2 | Bhagwani ... | 2 | | " ... | Iridectomy. Lens extracted on spoon. |
| 3 | Dani ... | 5 | | " ... | No iridectomy. |

| Number. | Name. | Years since operation. | Vision. | Amount of escape of vitreous. | Astigmatism. | Remarks at time of operation. |
|---|---|---|---|---|---|---|
| 1 | Mammon ... | 1 | | Drop ... | ... | Iridectomy. |
| 2 | Fata ... | 1 | | " ... | ... | " |
| 3 | Tabo ... | 1 | | " ... | ... | " |
| 4 | Deva Ditta ... | 2 | | " ... | ... | Lens dislocated by "Rawal." |
| 5 | Jhandoo ... | 7 | | " ... | ... | Iridectomy. |
| 6 | Fateh Din ... | 5 | 5/5 | " ... | + 0.75 D. cylinder. | " Very nervous patient. |

| Number | Name. | Years since operation. | Vision. | Amount of escape of vitreous. | Astigmatism. | Remarks at time of operation. |
|---|---|---|---|---|---|---|
| 7 | Achroo ... | 1 | $\frac{6}{9\cdot5}$ | Drop ... | ... | Iridectomy. |
| 8 | Mosaddi ... | 2 | $\frac{6}{6\cdot5}$ | " ... | + 0.75 D. cylinder. | " (*Note.*—Left eye operated on by Rawal. Never saw well with it. Now only sees hand movements.) |
| 9 | Sharo ... | 5 | $\frac{6}{9}$ | " ... | ... | Iridectomy. |
| 10 | Atra ... | 1 | $\frac{6}{6}$ | " ... | ... | Lens expelled, on completion of incision, with drop of vitreous. |
| 11 | Kalo ... | 2 | $\frac{6}{9\cdot5}$ | " ... | ... | Iridectomy. Vision $\frac{6}{9\cdot5}$ obtained with + 9.5 D. |
| 12 | Bhagwana... | 6 | $\frac{6}{6}$ | " ... | + 0.75 D. cylinder. | Noiridectomy. (Vision $\frac{6}{6}$ with + 9.0 D. Sp. + 0.75 cylinder.) |
| 13 | Ranji Das ... | 2 | $\frac{6}{9\cdot5}$ | " ... | ... | Iridectomy. (Cornea slightly hazy from old trachoma above.) |
| 14 | Ako ... | 1½ | $\frac{6}{6}$ | " .. | + 1.25 D. cylinder. | Iridectomy. |
| 15 | Ganda ... | 1 | $\frac{6}{6}$ | " ... | ... | Iridectomy. Vision $\frac{6}{6}$ with +9.0 D. lens. |
| 16 | Ganpat ... | 2 | $\frac{6}{6}$ | " ... | + 0.75 D. cylinder. | Iridectomy. (Vision $\frac{6}{6}$ with + 9.0 D. Sp. + 0.75 cylinder. |
| 17 | Daswandhi ... | 7 | $\frac{6}{9\cdot5}$ | " ... | ... | No iridectomy |
| 18 | Inchri ... | 1 | $\frac{6}{6}$ | " ... | ... | Iridectomy. |

| Number. | Name. | Years since operation. | Vision. | Amount of escape of vitreous. | Astigmatism. | Remarks at time of operation. |
|---|---|---|---|---|---|---|
| 19 | Biro ... | 1 | $\frac{6}{9}$ | Drop ... | ... | Iridectomy. Lens extracted on spoon. Very bad patient. |
| 20 | Hukram ... | 1 | $\frac{6}{4.5}$ | " ... | ... | Iridectomy. |
| 21 | Jamal Din ... | 6 | $\frac{6}{4.5}$ | " ... | ... | No iridectomy |
| 22 | Natha ... | 2 | $\frac{6}{24}$ | " ... | ... | Iridectomy. |
| 23 | Gangoo ... | 5 | $\frac{6}{9}$ | " ... | + 1.25 D. cylinder. | Iridectomy. Very nervous patient. |
| 24 | Raman San ... | 7 | $\frac{6}{9}$ | " ... | ... | No iridectomy (Vision $\frac{6}{9}$ with + 9.0 D. Sp. lens.) |
| 25 | Harnam Singh | 7 | $\frac{6}{4.5}$ | " ... | ... | No iridectomy. |

| Number. | Name. | Years since operation. | Vision. | Amount of escape of vitreous. | Remarks at time of operation. |
|---|---|---|---|---|---|
| 1 | Mamon ... | 2 | $\frac{6}{9}$ | Some ... | No iridectomy. Lens expelled with some vitreous on completion of incision. |
| 2 | Rahmat Ali ... | 1 | $\frac{6}{9}$ | " ... | No iridectomy. Lens expelled on completion of incision with some vitreous. |
| 3 and 4 | Gulaba (two eyes). ... | 6 mos. | $\frac{6}{9}$ | " ... | |
| 5 | Harnam Singh ... | 1 | $\frac{6}{9}$ | " ... | Iridectomy. Lens extracted on spoon. Very bad patient. |

TABLE B.

Showing—

(1) Number of years after operation.
(2) Vision.
(3) Astigmatism.

Number of cases—25.

| Number. | Name. | Years since operation. | Vision. | Amount of escape of vitreous. | Astigmatism. | Remarks at time of operation. |
|---|---|---|---|---|---|---|
| 1 | Hira Singh ... | 1 | $\frac{6}{4.5}$ | Unknown. | + 0.75 D. cylinder. | |
| 2 | Miran Bux ... | 7½ | $\frac{6}{6}$ | " | ... | |
| 3 | Ghulam Haider ... | 7 | $\frac{6}{6}$ | " | + 0.75 D. cylinder. | |
| 4 | Roha ... | 4½ | $\frac{6}{6}$ | " | + 1.25 D. cylinder. | |
| 5 | Mohammed Din ... | 1 | $\frac{6}{6}$ | " | ... | |
| 6 | Roda ... | 6 | $\frac{6}{6}$ | " | ... | |
| 7 | Omra ... | 2 | $\frac{6}{6}$ | " | ... | |
| 8 | Mali ... | 5½ | $\frac{6}{6}$ | " | ... | |
| 9 | Devi Ditta ... | 3 | $\frac{6}{6}$ | " | ... | |
| 10 | Ghanja ... | 5 | $\frac{6}{6}$ | " | ... | |
| 11 | Badh Singh ... | 9 | $\frac{6}{6}$ | " | ... | |
| 12 | Kaka Shah ... | 6 | $\frac{6}{3.5}$ | " | + 0.75 | |
| 13 | Iddoo ... | 6 | $\frac{6}{6}$ | " | + 0.5 | |
| 14 | Shah Din ... | 7½ | $\frac{6}{6}$ | " | + 0.5 D. cylinder. | |
| 15 | Mehtab Singh | 5½ | $\frac{6}{6}$ | " | + 0.75 D. cylinder. | |
| 16 | Mamon ... | 7 | $\frac{6}{6}$ | " | + 0.5 D. | |
| 17 | Dania ... | 3 | $\frac{6}{6}$ | " | ... | |
| 18 | Hakko ... | 4 | $\frac{6}{6}$ | " | ... | |
| 19 | Mammond ... | 2 | $\frac{6}{6}$ | " | ... | |
| 20 | Abdulla ... | 2 | $\frac{6}{6}$ | " | ... | |
| 21 | Juna ... | 3½ | $\frac{6}{6}$ | " | ... | |
| 22 | Naonid ... | 4 | $\frac{6}{6}$ | " | ... | |
| 23 | Tabo ... | 3½ | $\frac{6}{6}$ | " | ... | |
| 24 | Edoo ... | 6½ | $\frac{6}{6}$ | " | ... | |
| 25 | Shadi ... | 3 | $\frac{6}{6}$ | " | ... | |

TABLE C.

Cases in which opacity of the cornea was present.

Showing—

(1) Number of years since the operation.
(2) Vision.
(3) Amount of escape of the vitreous.
(4) Notes made on case sheet at the time of operation
(5) Notes on points of interest in brackets in the last column.

Number of cases—10 (9 patients, 1 double).

| Number. | Name. | Years since operation. | Vision. | Amount of escape of vitreous. | Remarks at time of operation. (Notes in brackets.) |
|---|---|---|---|---|---|
| 1 | Nathu ... | 7 | $\frac{6}{9}$ | Drop ... | Iridectomy. |
| 2 | Sabho Davia | 5 | $\frac{6}{9}$ | " ... | Iridectomy. |
| 3 | Hurkan ... | 4 | $\frac{6}{12}$ | " ... | Iridectomy. |
| 4 and 5 | Gulaba ... | 6 mos. | $\frac{6}{12}$ | Some ... | No iridectomy. |
| 6 | Harkan .. | 5 | $\frac{6}{12}$ | ... | |
| 7 | Suchet Singh. | 1 | $\frac{6}{12}$ | " ... | Lens extracted on spoon. |
| 8 | Jhandoo ... | 6 | $\frac{6}{12}$ | " ... | Iridectomy. Nervous patient. |
| 9 | Hakam Singh | 1 | $\frac{6}{12}$ | " ... | Iridectomy. |
| 10 | Ramai Dai ... | 6 mos. | Counts fingers at one yard. | " ... | (Corneal opacity very marked, caused by small-pox.) |

TABLE D.

Cases in which the capsule of the lens was left behind, owing to bursting at the time of the operation.

Showing—

(1) Number of years since the operation.
(2) Vision.

(3) Amount of vitreous escape (six cases only).
(4) Remarks noted on case sheet at time of operation.
(5) Notes on points of interest in brackets in last column.

Number of cases—8.

| Number. | Name. | Years since operation. | Vision. | Amount of escape of vitreous. | Remarks at time of operation (Notes in brackets.) |
|---|---|---|---|---|---|
| 1 | Ako ... | 6 mos. | $\frac{6}{9}$ | ... | (Capsule needled previously.) |
| 2 | Ahmad Khan | $1\frac{1}{2}$ | $\frac{6}{9}$ | Drop ... | No iridectomy. |
| 3 | Nihala ... | $4\frac{1}{2}$ | $\frac{6}{9}$ | ... | |
| 4 | Natha ... | 5 | $\frac{6}{12}$ | Drop ... | |
| 5 | Ahmed ... | 6 | Not noted by error. | " ... | Drop of vitreous taken out of right eye on account of tension. |
| 6 | Diwan Singh | 2 | $\frac{6}{12}$ | " ... | Iridectomy. |
| 7 | Gaunsa ... | 6 | $\frac{6}{60}$ | " ... | No iridectomy. |
| 8 | Shib Dial ... | 1 | Counts fingers only at 2 yards. | Some ... | Iridectomy. (Dense after cataract seen.) |

TABLE E.

Detailed notes on eight cases (seven patients, one double).

CASES WITH DISEASED CONDITION OF FUNDUS.

CASE 1.—Name, Bago. Operated on $1\frac{1}{2}$ years ago. "Drop" of escape of vitreous in both eyes—both extracted on spoon. Vision = $\frac{6}{18}$. States that he had very poor vision in both eyes before cataract developed. Had syphilis. On ophthalmic examination signs of old neuro-retinitis.

CASE 2.—Name, Para Singh. Operated on five years ago. Vision—can only count fingers. Sight was all right for two years after operation. Then had high fever with delirium. Pupillary reaction very sluggish. Disk pale.

Retina atrophied, probably caused by malarial optic neuritis.

CASE 3.—Name, Utman Dai. Operated on one year ago. Vision—can only see hand movements. Both lenses well extracted in the capsule with a "drop" of escape in the right. Disseminated choroiditis seen in both eyes on ophthalmoscopic examination.

CASE 4.—Name, Edoo. Operated on five years ago. Trace of escape of vitreous in right eye. Left eye lost previously from trachoma. Vision = $\frac{6}{18}$. Very stupid old man. Could give no clear history of his condition. Retina presents appearance of retinitis. Pigmentosa sine pigmento in an early stage.

CASE 5.—Name, Ram Singh. Operated on 1½ years ago. The right lens is noted as having been previously dislocated by the "Rawal" or lens coucher at the time of operation. It was noted also as having been expelled on completion of the incision with a "drop" of vitreous. Note made, "bad patient." Vision = $\frac{6}{18}$. On ophthalmoscopic examination the typical condition of retinitis pigmentosa sine pigmento, which always followed couching of the lens.

CASE 6.—Name, Hako. Operated on two years ago. Vision *nil*. Drop of escape in the left eye. Lens noted as dislocated at the time of operation. The same fundus condition as in case No. 5 but more advanced.

CASE 7.—Name, Khuda Bux. Age 60. Operated on 4½ years ago. Escape of vitreous in one eye only, amount not noted. Both lenses extracted in the capsule. Primary optic atrophy in both eyes.

# 121 CASES OF EXTRACTION OF CATARACT IN THE CAPSULE, BY THE METHOD OF MAJOR HENRY SMITH, OF JULLUNDUR, INDIA.[1]

By Dr. C. F. CLARK, Columbus, Ohio.

IN September and October, 1909, I undertook a trip to India for the purpose of making a careful study of Major Henry Smith's method of extracting the crystalline lens in

[1] Read in abstract before the Ophthalmic Section, New York Academy of Medicine, November 15, 1909.

It should be made clear that the report of these cases is not presented as one fulfilling all of the conditions usually imposed in the compilation of statistics.

Valuable as formal statistics may sometimes be they are not of the first importance, and the primary object of my visit to India was to be able to judge of the merits of the new operation by acquiring a degree of facility in its performance. The operations were performed in Major Smith's hospital under his direct supervision and with his advice and active assistance at every point and, in adopting an operative procedure differing in every way from those I had employed in an active practice of twenty-five years, it will be readily understood by operators of experience that the closest attention was required to the subject of technique and little time remained for the study and recording of statistical details. In fact I had performed a considerable number of operations before finding myself at ease with the new method, and such results as were obtained, fair as they often were, are not a true index to the possibilities of the operation.

Extractions in the capsule to the number of 245 were performed during my stay at the clinic. Of these Major Smith and others did 124 while I did the remainder.

The above impressions are therefore based on a study of 245 cases, but in the classification which follows I have confined my own report to the 121 cases in which I actually made the section and delivered the lens, making, in order to present the subject more fairly, a separate record of the accidents occurring in all the 245 cases seen during a stay of 23 days in Jullundur.

its capsule. The invitation from Major Smith to undertake this work in his clinic was due to the kindness of Dr. Green of Dayton, Ohio, and some time after my arrival in Jullundur Dr. Green and Dr. Vail of Cincinnati joined us and for a time we worked together in the clinic. I think it will be appreciated by those interested in the study of cataract that the privilege of seeing large numbers of cases each day, and the opportunity of discussing them with Major Smith and comparing notes on the remarkable operations being performed in this far-away hospital, was a unique and interesting experience.

A number of cases of extraction in the capsule had been reported at the June meeting of the American Medical Association, but, while these operations were supposed to have been performed by Major Smith's method,[1] they were so at variance in essential details, and the recorded results were of such a character, that it was apparent that the profession had failed to grasp some important features of what is acknowledged to be a highly technical procedure and to appreciate the exact significance of some details which are difficult to comprehend from a written description no matter how painstaking such a description may be.

Loss of vitreous, retention of a ruptured capsule, and entanglement of the pillars of the coloboma, resulting in a semilunar pupil and the well-known dangers which sometimes follow such incarceration, were the drawbacks to the adoption of an operative procedure which it was acknowledged by all would yield perfect results if these dangers could be sufficiently eliminated.

The almost complete elimination of iritis, the avoidance of a troublesome and sometimes dangerous operation for the division of the secondary membrane, and, above all, the possibility of operating in any stage of an immature cataract were the manifest advantages of extraction in the capsule which made it apparent to me that it was well worth my while to make the not inconsiderable expenditure of time and

[1] It is apparent that most of those in this country who have reported cases and described the Smith operation have not carefully read the description given by Dr. Arnold Knapp in the ARCHIVES OF OPHTHALMOLOGY, Vol. xxxvii., 1908.

money involved in an effort to seek information at the fountain-head.

Henry Smith, a surgeon major in the British Indian Army, is a man of strong character and unusual mental endowment who, by his own unaided efforts, has raised himself to a most enviable position in the Indian Medical Service, which, owing to the peculiar opportunities it affords, has contributed a number of brilliant men to the British medical profession.

A north of Ireland man from Ulster County and of the stock planted in that country by Cromwell, he is endowed with the strength and independence of judgment of his race and with perhaps less reverence for authority and less of the spirit of conciliation than is often required to make one's way smooth in dealing with the well grounded conservatism of the British medical profession, and bringing to its attention new ideas which the Briton instinctively shuns.

During some eighteen years, more or less, of active service as a civil surgeon, a large part of which time has been spent in Jullundur, Major Smith has built up a phenomenal practice in the course of which he has performed some 22,000 cataract extractions. For some ten years he has been developing and employing almost exclusively his peculiar method of extraction in the capsule, and I think all who have seen him work in his hospital in Jullundur will agree with me that with his wonderful and unequalled experience, his keen power of observation and correct surgical judgment, he has developed a degree of skill in this manipulation that is marvellous.

Accounts of these operations have from time to time appeared in the medical journals, and these, with the cases reported by Dr. Green and others at Atlantic City in June last, have served to fix the attention of the profession upon the great importance of the subject.

Such results as I had seen, while of the greatest interest, had not convinced me of the entire practicability of the operation and I felt that, while disastrous loss of vitreous might be avoided, there were still some most important questions to be settled in regard to retained, ruptured capsule and the rather frequent occurrence, in our American cases, of retention of the pillars of the coloboma in the wound. On these accounts I endeavored to approach the subject with an entirely open

and unprejudiced mind. However, several weeks of active work with Major Smith forced home upon me the conviction that, in his poorly equipped hospital amid the Punjab plains, in the far north of India, he has developed a method of extracting cataract *which when patiently studied and mastered* by others, as it has been by him, will prove a great boon to humanity.[1]

Extraction of the crystalline lens in its capsule (whether it is cataractous or not) is applicable only to adult life and should not be attempted before the age of thirty, "as the resistance of the suspensory ligament" (or the adhesion of the posterior capsule to the hyaloid) is so great that vitreous is quite sure to be lost, requiring resort to the insertion of the spatula into the vitreous chamber. It seems to be applicable to all of the ordinary forms of senile cataract whether mature, immature, or hypermature, hard, soft, or intumescent; the hypermature variety being, perhaps, most troublesome and the intumescent most satisfactory, as the latter is disposed, when properly handled, to "tumble" or turn over, the lower border of the suspensory ligament in this form giving way first and allowing the lens to turn on itself and present in the wound with its lower edge upward and its posterior surface anterior.[2] This makes possible the removal of the capsule even should it rupture during delivery.

Few ophthalmic surgeons have had opportunity to familiarize themselves with the exact condition and appearance of the cataractous crystalline lens in its capsule as, by the old operation, the capsule is ruptured and the lens changed in appearance or delivered in pieces. When delivered complete by the new method, one is struck by the great variation in size and appearance of the lenses and often by the thickness of the capsule.

It is very desirable, whenever it is practicable, to form some opinion, before operating, of the character of the lens one may be dealing with, as this may modify the technique employed.

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[1] Dr. Herman Knapp some years ago made the statement that if Major Smith could perfect his operation for the extraction of the lens in its capsule he would render a greater service to humanity than that rendered by the great Daviel.

[2] About 29% of all cases were delivered in this manner.

The more important points to be observed in operating are the following:

1. The Section.—*An ample section* should be made, with the point of puncture and counter-puncture as deep as may be without danger of injuring the iris. This is of the greatest importance. One half or nearly one half of the cornea should be included. Difficult delivery almost always resulted from a small section and in no instance did I see trouble of any kind follow as a result of making it unnecessarily large.

Major Smith prefers a section in which the knife emerges one and one half or two *mm* below the superior limbus, perpendicular to the surface, and it is worth a long journey to see this master hand make such a section, sometimes with a single graceful thrust of the blade from point to heel (or in other instances by a turn upward of the heel) at the completion of the section. Never a sawing movement. Other sections, provided they are large and deep, will answer, but a conjunctival flap is a decided disadvantage.

2. Control of the Eye.—After the iridectomy has been performed the speculum should be removed and a well trained and skilful assistant should slip a short-shanked strabismus hook beneath the upper lid and, while drawing the lower lid down with the left hand, should hold the upper lid on the hook well forward and away from the eye, with the thumb, index finger, and middle finger of the right hand grasping the handle of the hook, while the brow is drawn strongly upward by firm pressure with the ring and little fingers of the same hand.

The assistant to whom the duty of controlling the lids is entrusted should be thoroughly trained, skilful, and resourceful, and this position of the lids and brows, which renders the eye almost immovable, *is absolutely essential to success* and should be strictly maintained until the iris is replaced, the toilette of the eye is complete, and the lids are closed with the final dressing on them.

With the lids and brows in this position the eye seems to sink back into a pit and its walls to be relaxed, as in reality they are, and every operator should carefully study this phenomenon, as on it depends the relative freedom from danger during the subsequent steps of the operation. While

thus held one may, not only dislocate and manipulate the lens and press it out through the large wound, but replace the iris at his leisure, or, with the minimum of risk, remove a capsule if, unfortunately, it has ruptured.

It is of the utmost importance that, in spite of the inconvenience entailed, the operator should be content to work in this deep pit, and, if special care seems necessary owing to presenting vitreous, that the assistant should draw the lid still farther forward.

3. Manipulation for the Removal of the Lens.—In this, the culmination of the whole procedure, the operator should bear in mind that his object is first to rupture the suspensory ligament and then to force the lens into such a position that it shall occupy the whole of the wound while being delivered and thus prevent the vitreous from escaping. By careful inspection we endeavor to determine in advance whether the lens is intumescent ("a tumbler"), or not. For these cases, constituting, as elsewhere noted, about 29% of the total number, a special manœuvre will be described later on.

The hard, hypermature, and most of the immature lenses can more safely be delivered by the direct method, that is, with the upper edge emerging from the wound first. For these cases we proceed as follows: the blunt point of the strabismus hook should make rather sudden and firm pressure over the inferior border of the lens directly backward toward the optic nerve and this pressure should be maintained steadily.[1] This will usually suffice to dislodge the lens and, as it is seen and felt to yield, it must be immediately followed up by the point of the hook. (The lateral movements described by some writers and intended to aid in rupturing the suspensory ligament are usually not only unnecessary but harmful.)

Should the lens not move, it is at times advisable to make very light pressure with the end of the double spatula (which should always be held in the left hand for this purpose and in readiness to serve as a guide to the lens in case the vitreous should present in the wound). This light pressure with

[1] The hook, when used for the right eye, is steadied by the fingers held against the temple, while for the left eye it is laid across the bridge of the patient's nose, which makes it very steady.

the tip of the spatula over the lower nasal, or lower temporal, limbus sometimes acts like a charm when the steady backward pressure seems to meet with no response, but it must be used with care, and in a large proportion of cases the use of this instrument will not be required.

As soon as the lens yields, the probe end of the hook, which is indenting the cornea, should follow it up closely, by forcing the lower corneal flap under and behind it until, as the lens escapes, the displaced cornea falls into its normal position.

In some instances where pressure by means of the spatula would seem to be called for, the same effect may be produced by turning the heel of the hook down and making slight pressure on the lower portion of the ciliary zone. The degree of pressure and its variations must be determined by experience. When the lens has been half delivered and seems to be lodged with its equator outside the margins of the wound, the hook should be so placed as to hold it in its concavity and, with very slight pressure with the side of the hook on the edges of the wound, should be drawn from left to right to break the delicate suspensory ligament and remove the lens.

At this stage it will, of course, be understood that all pressure with the spatula has been withdrawn.

In rare instances at some stage in the operation an advantage may be gained by slight pressure with the convexity of the spatula on the sclera posterior to the wound.

If the lens is thought to be intumescent, an effort should be made to cause it to turn over and be delivered with its lower border upward and its posterior surface anterior as it emerges from the corneal wound. This is accomplished by first making pressure backward toward the optic nerve, as described above, and then dragging directly downward toward the patient's feet. When this is done it will be found that the hook is engaged above the lower sclero-corneal margin and is pulling downward in such a manner as to seem to tear the suspensory ligament away from the inferior lens margin.

As the lower border of the lens is seen, or felt, to yield, the hook must promptly follow it up and hold the cornea behind it until it is far enough out of the wound to be engaged in the concavity of the hook as described above.

4. Replacement of the Iris.—After the escape of the

lens, the cornea is often collapsed, and, not infrequently, the iris lies in the wound, especially at its extremities. This should be replaced with the greatest care, and not until this is done thoroughly should the lid be relaxed by the withdrawal of the hook. As the suspensory ligament of the lens is ruptured by this operation, and the wall formed by the capsule removed, it will, of course, be appreciated that the eye should remain closed and undisturbed by attempts at inspection until the corneal wound has had time to unite firmly; this union has usually taken place at the end of six days, and during this period the light dressing should remain in place. This is entirely practicable, as great immunity from iritis is one of the important advantages of extracting the lens in its capsule, and there is usually no need of opening the eye.

ACCIDENTS: The two accidents most likely to occur are rupture of the capsule and loss of vitreous. Their occurrence may depend upon conditions existing in the eye operated upon, or some unusual movement of the patient, and may be entirely beyond the control of the operator, or they may be due to some fault in the judgment or technique of the surgeon.

A light hand and good judgment as to the degrees and variations of pressure are of the utmost importance, but a large number of the accidents encountered will be traced to too small a section requiring undue pressure to deliver the lens.

Inherent weakness in some portion of the capsule may exist, and unusual tenacity of the suspensory ligament may be found even in rather old subjects; but in the cases which I have studied, while these accidents were not numerous, a fair proportion of them were due to causes which a larger experience should enable one to avoid.

A ruptured capsule occurring in a case in which the lens has turned over in delivery will generally protrude and may be removed with ease by means of a pair of broad-pointed dissecting forceps.

In all cases of rupture an attempt should be made to remove the torn capsule and, if this fails, it will sometimes be found possible to make an opening in it by means of the iris or capsule forceps. Major Smith has acquired great skill in

these manipulations and I observed that, with the brows held firmly drawn upward and the lower lid retracted while the upper was drawn well forward on the hook, it was possible to continue these manipulations with comparative freedom from danger.

Presentation of the vitreous is generally an indication that the lens is not being properly held up by the hook so as to keep the wound filled by that body. If rupture of the hyaloid occurs, or is imminent, the end of the spatula should be inserted slightly into the vitreous behind the lens (keeping its edge away from the posterior capsule to avoid rupture), and the pressure of the hook through the cornea should then be continued, sliding the lens up on the concave, anterior surface of the spatula which acts as an inclined plane. On three occasions I saw Major Smith deliver the lens in this manner after the vitreous had presented and without loss.

Prior to my visit to India I had read a number of accounts of intra-capsular extractions and had seen a few cases in the United States. This experience had led me to have some doubts as to its entire practicability. I believed, however, that even if it did not yield excellent results in a sufficient proportion of cases to warrant its general adoption, it still had a large field of usefulness in slowly advancing, immature cataracts and I was willing to make the expenditure of time and money involved in a long journey to equip myself for dealing with this class of cases.

Like many others I was skeptical on the following points:

First: As to the possibility of Major Smith's success being due to the racial peculiarities of his patients.

Second: As to the degree and final effects of loss of vitreous.

Third: As to retained, ruptured capsule.

Fourth: As to entanglement of iris in the angles of the wound.

Fifth: As to the degree of traumatism to which the eye was subjected.

My impression was that we were dealing with an operation which, while undoubtedly yielding brilliant results in many cases, was attended by cosmetic defects and more or less imperfect results in such a number as to make it inapplicable in our practice among a critical and exacting public excepting

in cases of immature cataract which could not await the ripening process.

The result of my investigation has been to impress me with the following facts:

First: That the operation is one not easily understood from a written description, and that the operations thus far reported in this country do not fairly represent Major Smith's method.

Second: That the peculiarities of his patients do not account for his success.

Third: That, *when properly performed*, loss of vitreous is not of such frequent occurrence or of such quantity as to be a serious source of danger. See Captain Lister's report[1] of his investigations of Major Smith's cases of loss of vitreous, which will appear as an appendix to the book which has recently been written by Major Smith.

Fourth: That ruptured capsule can *generally* be removed. This is not always the case, however, and, while of infrequent occurrence, retention of a ruptured capsule is one of the accidents we must reckon with, and it would be well to make such an investigation of this subject as was made by Captain Lister in cases of loss of vitreous.

Fifth: That entanglement of the iris may generally be avoided if care is observed.

Sixth: That the degree of traumatism is not much, if any, greater than by the old operation and does not seem to endanger the ultimate results.

I think these impressions will be confirmed by a study of the records of our operative work and a brief summary of the accidents which we met with may be of interest to the reader.

The following is a record of the cases of loss of vitreous and rupture of the capsule occurring in 121 extractions by Major Smith's method:

Loss of vitreous:

Vitreous presented but receded without rupturing in 6 cases = 4.9%

A small amount ($\frac{1}{8}$ or less) was lost in 7 cases = 5.8%.

This was generally only a very small amount and not apparently sufficient to endanger the result.

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[1] Preceding article in this number.

Rupture of capsule:

Capsule ruptured and was removed in 9 cases = 7.43%. These were left in good condition.

Capsule ruptured and retained in 1 case = 0.83%.

Delivery of the lens by the introduction of the spatula, 1 case = .83%.

In the 245 cases, including those operated by Major Smith and other surgeons operating with him, as well as the cases recorded above, we have the following record of accidents. It should be remembered, however, that these are not selected cases and include many complicated and unfavorable ones which should not have been included if the object were only the collection of statistics for the purpose of comparing this with the old method of operating.

Loss of vitreous:

Vitreous presented but receded without rupturing in 10 cases = 4.08%.

A small amount lost ($\frac{1}{8}$ or less) in 11 cases = 4.49%.

As in the above cases, this was generally a very small amount.

Rupture of the capsule:

Capsule ruptured and removed in 14 cases = 5.7%.

Capsule ruptured and retained in 7 cases = 2.85%.

Attempt (apparently successful) made to perforate retained capsule in 6 cases.

Delivery of the lens by the introduction of the spatula in 4 cases = 1.63%. (In three of these there was no loss of vitreous.)

Lens failed of delivery in 1 case = 0.41%.

In an appendix to Major Smith's book on extraction of the lens in its capsule, which is now in press, Captain Lister (as mentioned above) has given the results of a most painstaking and valuable investigation into the late results in cases in which there has been loss of vitreous, and, while my own observations, based on the study of 245 cases, would indicate that the amount of vitreous lost was only in the rarest instances sufficient to warrant apprehension as to the final result, I feel that his conclusions, based, as they are, on the study of a large number of cases seen in many instances years after operation, should go far toward setting at rest the fears

which have been expressed on this subject. All will, of course, grant that the loss of a large amount of vitreous is possible when this operation is improperly performed, but a study of the cases reported above will show that, when the proper precautions are observed, a loss of any considerable amount is of the rarest occurrence.

I can speak with less assurance of the *final* results in those few cases in which the capsule ruptures and remains in the eye after the suspensory ligament has been broken and the lens delivered. It would seem that this broken capsule should be easily dealt with later on as a secondary cataract, provided it has not been so entangled in the wound as to cause complications, but, while it will be seen from the accompanying records that this is not of very frequent occurrence, it is one of the accidents we must reckon with, and it is of the utmost importance that another series of cases should be studied with reference to its effects, as Captain Lister has studied the ultimate effects of loss of vitreous.

It should be said, however, that if we are to make a fair comparison between the merits of this operation and the old method we should not only critically examine at the end of a period of years the cases in which vitreous has been lost or the ruptured capsule retained, in extraction within the capsule, but also those cases, operated by the old method, in which iritis or cyclitis has resulted, a source of danger largely eliminated by the Smith operation.

It is my belief that ultimate failures from this cause would prove more than an offset for those due to the accidents we are now considering.

Those who have seen this operation performed by others in America, and who have read some of the published descriptions, are impressed with the fact that in some of the most important details, the operation, as performed by Major Smith, has not been followed and, as a consequence, much of the benefit which should be derived from his enormous experience has been lost.

The fact that the lens may be inverted has made such a deep impression on operators that they have lost sight of the equally important fact, that great judgment is required in determining to which class of cases this manœuvre is applicable,

and it is most probable that much of the loss of vitreous reported is due to efforts to force inversion in cases not well adapted to it. As has been mentioned elsewhere, in all of the operations witnessed by me the lens was inverted in only about 29%, these being the so-called intumescent lenses.

While my stay in Jullundur was not long enough to enable me to follow up these cases as I would have liked, the patients generally left the table in good condition and I had the privilege of seeing many at the end of ten days or two weeks after operation, and quite a number of those who had been operated on from one to four years previously returned for operation on the other eye while I was there.

The condition of these cases, and especially the freedom from iritis, convinced me that our fears of secondary ill effects from this method of delivering the lens are not well founded, and gave me great confidence in the report of the admirable ultimate conditions found by Captain Lister as the result of his careful study of a large number of Major Smith's patients returning for investigation after periods varying from one to ten years.

This is, however, an operation which I fear is very sure to fall into disrepute unless those who undertake it are willing to devote to the subject enough time and attention to master certain details, for, while these details are quite simple, and easily understood, *they are absolutely essential to success.*

The question has been raised as to whether this operation is applicable to all cases of cataract. Certainly it is not applicable to cataract in young people, probably not before thirty years of age; and while, with this exception, Major Smith, with his unusual experience and skill, is able to employ it quite generally, it is my belief that when we have gained a broader experience and a fuller knowledge of the strength of the suspensory ligament and the varying degrees of adhesion between the posterior capsule and the hyaloid membrane in the various forms of cataract, we will discover certain important limitations in its application and be enabled to act in the selection of our cases with that careful and judicious discrimination which should be the strongest characteristic of the conservative surgeon.

# REPORT OF A CASE OF CYST OF THE IRIS.

By Dr. DAVID WEBSTER, New York
AND
Dr. EDWARD L. OATMAN, Brooklyn, N. Y.

(*With three figures on Text-Plate I.*)

Albert S., æt. forty-eight, colored, married, and a laborer by occupation, consulted me March 12, 1909. He said that when about twelve years of age his right eye was struck with a stone hurled at him by another boy. The injury destroyed the sight immediately, but the eye though blind gave him no trouble until within the last few months, when it has become inflamed and painful, and constantly growing worse. I found the eyeball red and tender on pressure. The anterior chamber was deep and the crystalline lens was opaque. Nearly filling the nasal half of the anterior chamber was a smooth, translucent tumor, pressing the iris back and apparently attached to a corneal opacity in front of it. The opacity of the cornea was undoubtedly the cicatrix resulting from the healing of the original wound. As the eye had long been totally blind and as it seemed improbable that simply removing the cyst would relieve the pain and arrest the deep-seated inflammation, I advised enucleation. With the patient's concurrence, the operation was performed a few days later at the Manhattan Eye, Ear, and Throat Hospital, and the enucleated eyeball was placed in the hands of Dr. Edward L. Oatman, who reports as follows:

*Pathological Findings* (Dr. Oatman): One third of the anterior chamber is occupied by a cyst, formed in the stroma of the iris and lined with lamellated epithelium. The cyst extends nearly to the centre of the cornea, whence

it extends abruptly backward to the iris. (Fig. 1.) It accurately fills the sinus on the nasal side of the chamber and is intimately attached to the cornea, ciliary body, and lens. (Fig. 2.) At one place the cyst wall is embedded in a large mass of fibrous tissue projecting from the cornea into the anterior chamber. This may be regarded as the site of a former perforation, through which the epithelium forming the cyst extended into the anterior chamber. The angle of filtration is obstructed throughout that region occupied by the cyst, the ciliary processes being forced backward by its growth. In the remaining parts of the chamber the angle appears to be open. In some regions, where the free wall of the cyst leaves the cornea, Descemet's membrane appears to be continued from the cornea on to the outer surface of the cyst. Where this appearance is presented, the cyst wall is made up of an external hyaline layer irregularly covered with *endothelial* cells and an internal layer of condensed iris tissue lined with *epithelial* cells. (Fig. 3.) The origin of this hyaline layer is not readily determined. Like Descemet's membrane, it may have been deposited by corneal endothelium which has extended on to the cyst, or by the normal endothelial cells covering the iris, which have responded to prolonged irritation by the formation of a hyaline cuticular membrane. The epithelium lining the cyst is of corneal or conjunctival origin, and varies from one to four or more layers in thickness. The cells are least numerous anteriorly, where they are separated from the cornea by a poorly defined line of pigment, which is all that remains of the atrophic iris in this locality. As a rule, the cells are flattened and atrophic, and the protoplasm usually contains pigment granules. Some parts of the cyst are crossed by bands of tissue. The contents of the cyst are composed of granular material, pigment, epithelial cells, and cellular detritus. The aqueous humor is moderately albuminous. The lens is shrunken and partly absorbed. The retina is highly atrophic, especially in its outer layers. The choroid is very thin, only the larger vessels remaining. The optic nerve is not excavated.

TO ILLUSTRATE DR. WEBSTER'S AND DR. OATMAN'S ARTICLE

"REPORT OF A CASE OF CYST OF THE IRIS."

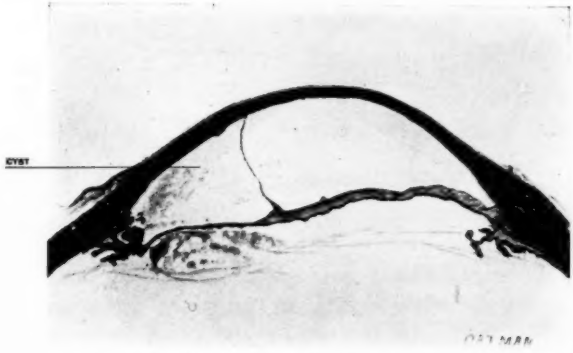


FIG. 1.—Epithelial cyst of iris, occupying more than one third of the anterior chamber.

FIG. 2.—Sinus of anterior chamber filled by cyst of the iris. Ciliary processes are pushed backward by growth.

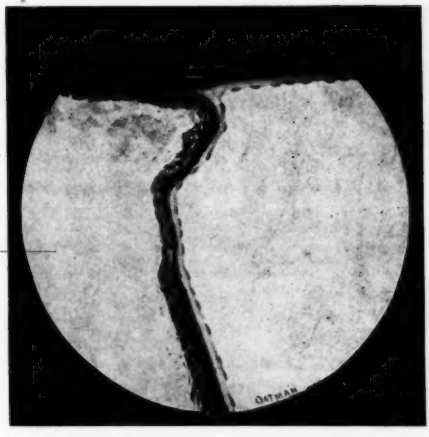


FIG. 3.—Hyaline membrane, continuous with Descemet's membrane, covering surface of iris cyst. Cyst wall is covered with endothelium and lined with epithelium.

# DILATATION OF THE PUPIL DUE TO BELLFLOWER, "DATURA ARBOREA."

By Dr. JUAN SANTOS FERNÁNDEZ, Havana.

Translated by Dr. Francisco M. Fernández.

WE have decided to write this paper, because we have read the case described by Wollert,[1] not long ago, and abstracted by Morax,[2] concerning a workman employed in a manufacture of articles of fashion where the beans of *Datura* were used in the fabrication of artificial flowers. One of them fell on his conjunctiva, producing a monocular dilatation of the pupil. We also have observed two cases of dilatation of the pupil, monocular, produced by a fragment of another Solanacea, less known, the bellflower (*Datura arborea*), without knowing the exact way in which it touched the conjunctiva.

Wollert caused, experimenting with dogs, the dilatation of the pupil in 15 minutes, introducing a bean in the palpebral *cul-de-sac* of the lower lid; but we were not able to produce the phenomenon in rabbits, although we introduced in the conjunctiva some fragments of the shrub, and also instilled a part of the liquid obtained by pressing it. These experiments were carried out at the time of our first case. When we had our second case, we were able to produce the dilatation of the pupil in two young individuals, by touching the conjunctivæ with a piece of a broken sprout, before fifteen minutes had passed.

The same procedure, employing the leaves, produced no effects.

Here are our two cases:

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[1] *Klinische Monatsblaetter für Augenheilkunde*, p. 468, June, 1904.

[2] *Annales d'Oculistique*, p. 140, 1905.

OBSERVATION 1.—Mrs. A., a widow, thirty-nine years old, suffered from a nervous condition, and her physician recommended exercise. One afternoon, she was in her garden cutting with a knife the sprouts of a shrub taller than a man; this arbust is known by the name of bellflower (*Campanula*), on account of its flowers, that resemble a bell. In cutting one of the branches, a fragment fell on her left eye. She took it off and kept on working; she said it was a part of a leaf, but she was not very sure of it.

Very soon afterwards she noticed difficulty of vision in her left eye, but did not get alarmed until, in front of a mirror, she saw the widely dilated pupil. On that account she came to us, much alarmed, but she did not tell us what had happened to her in the garden. That we ascertained after we had asked her if she had put in some drug, or if the juice of some plant had fallen in her eye. We ordered pilocarpin, and on returning to her house the pupil was smaller and on the next day was natural in appearance. We had some branches of that shrub brought to us from her garden and we put fragments into the eyes of some rabbits without producing any dilatation of the pupil. In others we instilled the juice extracted by pressing it, also without any results.

This case left us in doubt whether the shrub had produced the dilatation of the pupil or whether this was due to a nervous manifestation in a habitually excitable person.

OBSERVATION 2.—A. W. E., a boy, four years old, of American parents, was brought to us by his parents, who were alarmed because he had his left eye pupil dilated. His mother thought that her child might have injured his eye with a fork, especially so when she noticed a blood stain on his clothing. The child was taken to the family physician, Dr. Lainé, who did not find anything to account for the dilatation of the pupil and referred them to us. We could not ascertain what had caused it; but fortunately we noticed that the mother had brought with her a fragment of the bellflower, for she had seen her child playing with it, and, with a maternal instinct often noticed by us, she suspected that that was the cause. After what we had seen of the first case, we could tell the mother that that was what had caused the dilatation of the pupil, and ordered a 0.5% solution of pilocarpin three times a day.

With a stump of the branch which the mother of the child left us, we touched the conjunctiva of a young man, about twenty, and in twenty-four hours the pupil had become

dilated. A few days later, we got some more branches of the arbust and, by pressing, some juice was obtained which was rubbed on the fingers and these rubbed against the borders of the lids, and in a very short time the pupil was dilated, thus confirming the diagnosis of the previous case.

Bellflower is very common in Cuban gardens and is a species of the Datura genus of the Solanaceæ family and of the Daturæ tribus. The species of this genus originate from the tropical regions of Asia and America; only one grows in Europe, the most important of them, *Datura stramonium*, commonly called stramonium.

*Datura arborea* L., from Peru and Mexico, which is the one we refer to, is commonly known as the judgment's trumpet, and it is used in Peru for the preparation of a narcotic beverage called *Tonga*.

According to Dujardin-Beaumetz, the difference between these species and stramonium depends only on the greater or lesser energy of its toxic action.

# SPECTROGRAPHIC STUDIES CONCERNING THE LIMITS OF ABSORPTION OF OUR PROTECTIVE GLASSES.

By Dr. OTTO HALLAUER, Basle.

(*With eight illustrations on Text-Plates II.–IV.*)

Translated from the German Edition, Sept., 1909, by Dr. Matthias Lanckton Foster.

IN August, 1907, I recommended in an address before the Heidelberg Ophthalmological Society a gray-green glass for the purpose of protection against maximal light strengths on the ground of photochemical experiments. Since that time a number of glasses have been brought forward as particularly adapted for the prevention of great irritation by light. Thus Dr. Vogt of Aarau advocates an almost colorless flint of type 0.198, Dr. Gonin of Lausanne a red-brown glass, the firm of Rodenstock in Munich the gray-yellow enixanthos glass, Schanz and Stockhausen of Dresden the so-called euphos glass in greenish yellow and more recently in smoky gray. With these manifold and complicated offers of protective glasses, the question that interested me was how far all these new contrivances would stand an exact spectrographic measurement of absorption by a suitable instrument. A critical determination of the limits of absorption of such glasses also seemed to be important, because in that way alone could their usefulness be proven. For this purpose I used a Pulfrich's quartzspectrograph, and Dr. Zickendraht was so good as to undertake these investigations with me. After several trials the iron arc light was chosen as the most suitable source of light for such studies. The spectrum of this light is distinguished from other spectra by an extraordinary richness of lines, as shown in the accompanying plate, in comparison

To Illustrate Dr. Hallauer's Article on "Spectrographic Studies Concerning the Limits of Absorption of Our Protective Glasses."

Fig. 1.

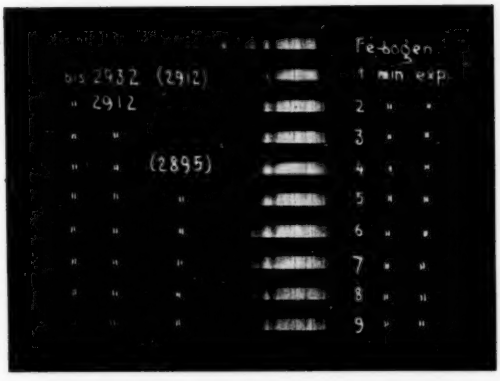



Fig. 2 (plate 23)

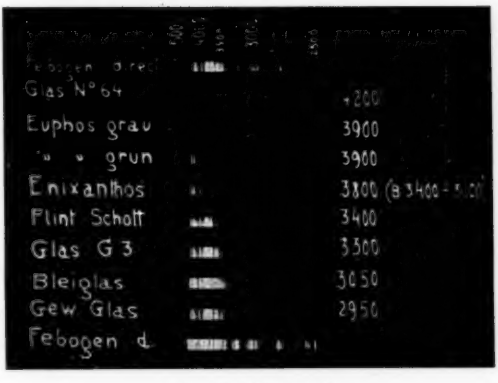



Fig. 3 (plate 21)

with that of the amalgam lamp. This peculiarity permits a very exact measurement of the absorption bands by means of the characteristic lines under the microscope. We used an iron arc light of 50 volts and 5 ampères. The width of the gap was $\frac{1}{40}$ *mm*. To receive the spectra, ordinary light plates with subsequent glycin development for five minutes were used.

The spectrum of the iron arc was first fixed photographically on the quartzspectrograph, and then the light, after it had passed through the glass to be tested. First the shortest wave lengths that would pass through a glass were to be ascertained, and the duration of exposure necessary to bring out the last photographable lines through which the theoretical limits of absorption are approached was to be learned. The following experiments give information on both of these points. (See Fig. II., plate 23.)

The absorption of a plate of ordinary glass 1.25 *mm* thick in exposures varying from 1 to 9 minutes was first determined. The extreme attainable lines appeared after four minutes with 2859 Angström (1 Angström unit equals 0.0000001 *mm*) or 285.9 $\mu\mu$. Four minutes then suffices for the absorption measurement of unstained glass. An ordinary glass 1.25 *mm* thick absorbs up to 2859 Angström.

Next for investigation was how far the colored glasses recommended for protection could influence the short and the long waved portions of the spectrum in comparison with common glass. The permeability of various glasses of this nature, without reference to their thickness and with one minute exposures, is shown on two plates. Fig. III., plate 21, shows the following comparative limits.

(Iron Arc Light.)

| | | | |
|---|---|---|---|
| Ordinary glass absorbs to | 2950 Angström | | |
| Lead glass " " | 3050 " | | |
| Gonin's glass " " | 3300 " | | |
| Schott's flint (schwerflint) Type 0.198 absorbs to | 3400 " | | |
| Enixanthos " " | 3800 " | (lines 3400 to 3100). | |
| Euphos green " " | 3900 " | | |
| Euphos gray " " | 3900 " | | |
| Glass No. 64 (the author's) absorbs to | 4200 " | | |

Fig. IV., plate 22, gives a comparison of all the protective glasses used as yet from blue to euphos gray under the same conditions as above.

(Iron Arc Light.)

| | | | | | |
|---|---|---|---|---|---|
| Blue glass | (medium shade) | | to 3000 | Angström | |
| Smoky glay | " | " | " 3250 | " | |
| Fieuzal yellow | " | " | " 3750 | " | |
| Enixanthos | " | " | " 3800 | " | (lines 3400 to 3100) |
| Glass No. 64 (the author's) | " | " | " 4200 | " | |
| Euphos green | " | " | " 3900 | " | |
| Schott's flint | " | " | " 3400 | " | |
| Gonin's glass | " | " | " 3300 | " | |
| Euphos gray | " | " | " 3900 | " | |

When we remember that according to Listing the ultraviolet rays reach from 0 to 3970, or in round numbers to 4000 Angström, and that the violet and blue rays are to be eliminated likewise, it is evident that the protective glass is that which reduces to the greatest degree the blinding portion, over 4000 Angström, without great loss of light. But, according to the plates shown, high absorption values were attained only by the Fieuzal glass (3750 A.), the green and gray euphos glasses (3900 A.), and my glass (4200 A.). The absorption of all the other glasses is quite insufficient. Thus the enixanthos glasses show lines representing 3400 to 3100 Angström. The schwerflint of Schott, the glass of Gonin, the smoky and the blue glasses only moderately exceed the absorption limits of ordinary clear glass. The slight and insufficient power of absorption of all these glasses involves their uselessness in those cases in which a complete arrest of the ultraviolet rays is required. This is very clearly shown in plates 21 and 22 with time exposures of one minute, for when an insufficient absorption is shown in this length of time a longer radiation will reveal still less absorption.

There are two important factors to be taken into consideration, along with the chemical composition, in obtaining good absorption in a glass—the shade and the thickness. Figure V. (plate 43) gives an illustration. The numbers 65, 64, 63, and 62 are the shades of my gray-green glasses in thicknesses of 3, 2, and 1 *mm*. The darker and chiefly used shades 65

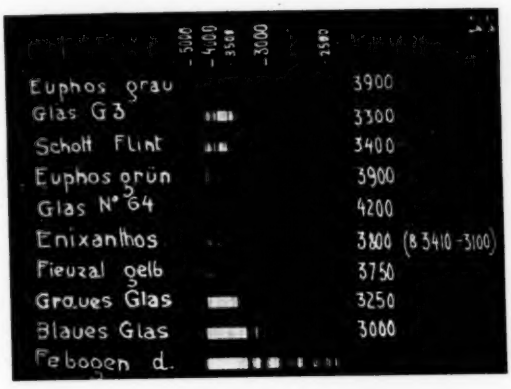



FIG. 4 (plate 22)

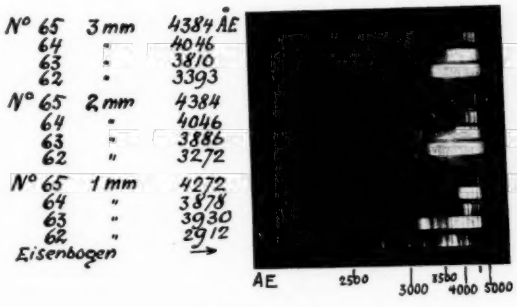
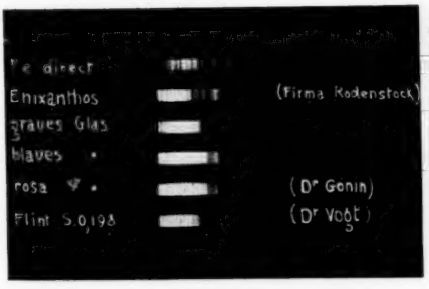



FIG. 5 (plate 43)




| Dicke mm | Exposition 1 min AE | 10 min AE |
|---|---|---|
| 0,95 | 3800 | 2852 |
| 1,5 | 3250 | 3287 |
| 1,5 | 3000 | 2954 |
| 2,15 | 3300 | 3010 |
| 1 | 3400 | 3370 |

FIG. 6 (plate 45)

and 64 experience only a relatively slight loss in absorption power, even in the thickness of 1 *mm;* the lighter shades considerably more. Thus, as shown by the accompanying figures, No. 65 loses 112 Angström from a reduction of thickness from 3 to 1 *mm*, while glass No. 62, the lightest shade, under the same conditions loses 421 Angström, almost four times as much.

Returning to the duration of the radiation of the glasses, I have to say that they were exposed for different times up to two hours. According to the results obtained from the different exposures a much shorter time of radiation, five to ten minutes, suffices for a positive judgment on the colored glasses, especially when a glass is to be tested in regard to its protective effect and its permeability. Figures V., VI., VII., and VIII. were taken with exposures of ten minutes.

Figure VI. (plate 45) will explain the above mentioned, reduced proportions for Figures III. and IV. from prolonged radiation (10 minutes). The absorption values have decreased notably, as shown by the accompanying figures. The great difference in enixanthos is due to the use of a glass 2.5 *mm* thick at the first exposure (1 minute), and that of a thinner one (0.95 *mm*) of the same shade at the later exposure for 10 minutes. With the smoke glass the somewhat higher number in the column under 10 minutes is to be ascribed to a slightly darker shade of the glass used.

Figures VII. and VIII. (plates 41 and 44) show the absorption limits of the euphos glasses after ten minutes' exposure.

The two following tables show how far the shades and the thickness of the euphos glasses in green-gray, as well as my own gray-green glasses, influence the short and long waved rays of the spectrum.

| No. | Glass No. | Thickness *mm.* | Light passing through (violet) | | | | (red) |
|---|---|---|---|---|---|---|---|
| *1. | No. 9, IV. | 3.30 | from 4132 Angström up. | | | | |
| *2. | " | 2.10 | " | 4064 | " | | |
| *3. | " | 1.30 | " | 3969 | " | | |
| 4. | No. 9, I. | 3.30 | " | 3887 | " | | |
| 5. | " | 2.10 | 3193 to | 3526 | " | (3570 traces 3735). | |

| No. | Glass No. | Thickness *mm.* | (violet) | Light passing through | | (red) |
|---|---|---|---|---|---|---|
| 6. | No. 9, I. | 1.10 | | from 3067 Angström up. | | |
| *7. | No. 6, III. | 3.30 | | " 4132 | " | |
| 8. | " | 2.25 | 3100 to | " 3220 | " | 4031. |
| 9. | " | 1.45 | 3000 (trace) | " 3021 | " | to 3306 3969. |
| 10. | No. 6, I. | 3.20 | | 3021 | " | |
| 11. | " | 2.05 | | 2994 | " | |
| 12. | " | 1.35 | 2929 (traces) | 2937 | " | |
| 13. | No. 410 (smoke gray) (4 min. expos) | 1.65 | 3195 to | 3477 | " | 3880. |

HALLAUER'S GLASSES

| No. | Glass No. | Thickness *mm.* | (violet) | Light passing through | | (red) |
|---|---|---|---|---|---|---|
| *1. | No. 65 | 3.10 | | from 4384 Angström. | | |
| *2. | " | 2.00 | | " 4384 | " | |
| *3. | " | 1.05 | | " 4272 | " | |
| *4. | No. 64 | 2.90 | | " 4046 | " | |
| 5. | " | 1.95 | 3042–3228 | 4046 | " | (traces 4031). |
| 6. | " | 1.00 | | " 3878 | " | |
| 7. | No. 63 | 3.05 | | " 3371 | " | (- weakening 3810). |
| 8. | " | 2.05 | 3021 to | 3355 | " | 3886. |
| 9. | " | 1.05 | 2995 to | 3306 | " | 3930. |
| 10. | No. 62 | 3.15 | | " 3393 | " | |
| 11. | " | 2.01 | | " 3271 | " | |
| 12. | " | 1.00 | | " 2912 | " | |

As can be seen from these two tables all shades and thicknesses of both the euphos and my own glasses are not perfectly protective against ultraviolet. Only those marked above with a * arrest the short waved rays to the uppermost limit, according to Listing 3970 Angström. All other shades and thicknesses show more or less permeability for these rays.

CONCLUSIONS.—Schott's schwerflint glass of type 0.198 (Vogt), the glass of Gonin, and the enixanthos glass fail to give a perfect absorption of the ultraviolet rays. Perfect protection against them is furnished by the euphos glasses and by my gray-green glass, but by both only in certain numbers. These numbers of the euphos are 9, IV. and 6, III. in the greenish shade. The highest absorption limit is for 9, IV. in the 1.3 *mm* thickness, at 3969 Angström. Of my glasses those that completely arrest the ultraviolet are No. 65 in thicknesses from 1 to 3 *mm* and No. 64 in the thickness of

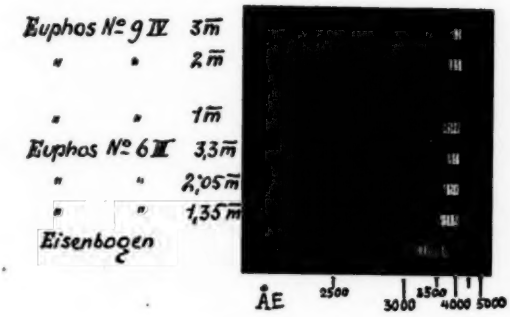



FIG. 7 (plate 41)

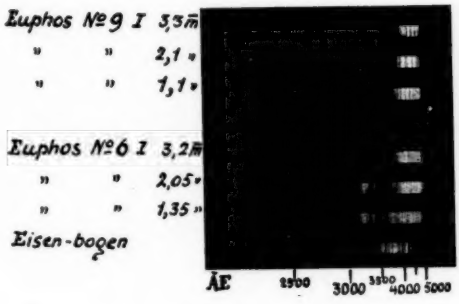



FIG. 8 (plate 44)

3 *mm*. The absorption of No. 65 (1 *mm*) reaches 4272 Angström. Together with the entire elimination of the ultraviolet with slight loss of light, this glass also suppresses the violet and blue (dazzling) rays of over 4000 Angström to the extent of 272 Angström.

# ELEVENTH INTERNATIONAL CONGRESS ON OPHTHALMOLOGY, NAPLES, APRIL 2–7, 1909.

(*Continued from page 504, Vol. XXXVIII.*)

REPORT, FROM MANUSCRIPTS, BY DR. W. CLAUSEN, BERLIN.
Translated from Vol. LXIV., No. 1, German Edition of these ARCHIVES, by Dr. PERCY FRIDENBERG, New York.

SECOND SCIENTIFIC SESSION, April 5th. The Committee on Uniform Designation of Meridians in Astigmatism submitted a report recommending that the zero point be placed at the nasal end of the horizontal, passing downwards and out to 180° at the temporal end. In the discussion, JESSOP advises the use of the upper semicircle for numbering. LANDOLT prefers to have the zero point at the upper end of the vertical and to count 90° to either side. AXENFELD notes that we describe ocular torsion according to the displacement of the upper end of the vertical meridian and thinks the same rule should hold in designating the axis of astigmatism. He prefers, according to Laurence–Pergens, to have the zero point, in both eyes, at the upper end of the vertical, and to count 90° "nasal" or "temporal" to the horizontal meridian. The suggestions of the committee were adopted by a bare majority.

31. **Irrigation of the anterior chamber in cataract operations.** VILLARD (Montpellier) uses Aubaret's double canula (Luer, Paris) which combines injection with automatic suction, thus preventing all increase of intraocular tension. Sterile physiological saline solution is used.

32. **Treatment of immature cataract.** GIDNEY (Assom) describes the disadvantages of the usual extraction methods. He prefers extraction, or rather expression, in the capsule

after iridectomy, which is specially adapted to immature cataracts so that the operation can be performed at any time and the patients attended to without being obliged to give up work for a long period. In the discussion, PAGENSTECHER, Jr., reports bad results with the Indian operation, and warns against the adoption of this method for any but hypermature, complicated, or shrunken cataracts.

33. **Anomalous varieties of pterygium.** MENACHO (Barcelona) describes cases of malignant, epitheliomatous, and cystoid pterygium, and a penetrating type which burrowed into the depths of the cornea, and communicated with the anterior chamber.

34. **Universal decimal test type.** ARMAIGNAC describes a test card consisting of Roman letters and figures on the principle of the minimum separabile.

35. **Blepharoplasty for non-trachomatous trichiasis.** FORTUNATO describes a new method, suitable for cases with normal conjunctiva. The lid margin is split and a strip of conjunctiva from the upper fornix, with which it remains in contact by a small pedicle, laid into the hollow with the mucosa outward. In the discussion, MACCALLAN (Cairo) prefers the methods of Mellinger or Streatfeild–Snellen for entropion to this procedure, which is by no means new and which he has used in many forms of lid deformity.

36. **Simple occlusive bandage for the organ of vision.** BLANCO (Valencia) describes the application of simple eye-shields.

37. **Protective spectacles.** SCHANS and STOCKHAUSEN (Dresden). Dazzling is caused by invisible, ultraviolet rays as much as by others, causing fluorescence of the lens and media and retina, which produces a faint glow and interferes with sight, producing exhaustion by constant drain and decomposition of visual purple. External irritation, snow-blindness, and electric ophthalmia are due to the same cause. Euphos glass which cuts off these rays without reducing the light has a yellowish green cast. To cut down intense visible rays, colored glasses act in a one-sided way; smoked glasses cause nyctalopic adaptation and increase sensitiveness to light. Blue glasses favor the passage of ultraviolet rays. The smoke-gray euphos glass cuts off these rays and protects the

eye with a comparatively light shade, thus avoiding sensitization. In the discussion, BIRCH-HIRSCHFELD (Leipzig) thinks the view of irritation of the eye by rays of short wave length has been greatly exaggerated. It is not necessary to cut off the ultraviolet rays of sunlight or of the usual artificial light. After hours of work in front of the mercury vapor lamp with ordinary smoked goggles, he noted no discomfort at all. There is nothing to show that ultraviolet light causes cataract. For special work, such as glass-blowing, or work with the arc light or mercury vapor lamp, gray euphos glass protectors are advisable.

AXENFELD, too, refers to exaggerated fear of ultraviolet rays. Their exclusion is of practical importance in a few trades and in retinitis pigmentosa during exposure to daylight.

GONIN (Lausanne) notes having prescribed amber or yellow-green Fieuzal glasses for snow-blindness and retinitis pigmentosa, with good results.

38. **Head-light with lens holder.** GUTMANN (Berlin) describes an electric attachment allowing focal illumination of the field of operation.

39. **Case of primary internal ulcer of the cornea.** VALENTI (Rome) noted a defect of corneal endothelium which spread in a few days and encircled the entire limbus with yellowish discoloration of the parenchyma and hypopyon, which on evacuation was found to be sterile by inoculation. Local treatment and inunctions were given. Complete recovery in two months. Valenti thinks the affection was due to circulating toxins of syphilis.

40. **Iridencleisis in chronic glaucoma.** HOLTH (Christiania) reports two cases of progressive loss of vision and contraction of visual field in spite of iridectomy and sclerotomy. The disease process was cut short by iridencleisis which was followed by prompt improvement of sight and fields. The incarceration should be combined with flap-shaped or meridional iridotomy unless iridectomy has preceded, wholly subconjunctival and about 1*omm* from the limbus. The lance knife is advised. Holth has never lost an eye nor seen sympathetic ophthalmia develop after this procedure. It is contraindicated in glaucoma secondary to uveitis. A filtering

scar was obtained in over 86% of his cases, with normal tension. Meiotics were not required. Vision and fields remained constant or even improved slightly.

42. **The filtering cicatrix in glaucoma.** BASSO (Genoa) concludes that the formation of a large conjunctival flap tends to delay healing of the scleral section. This is the explanation of the filtering scar in Lagrange's operation, which should be performed with a Graefe knife. The advantages of the conjunctival flap are the facility of regulating circulation, the formation of a fistulous cicatrix completely covered by conjunctiva, which prevents the formation of a cystoid, irregular, or but partly fistulous cicatrix.

44. **Prevention and treatment of retinal detachment and progressive myopia.** DRANSART (Somain) urges iridectomy, subconjunctival injections, and rest in bed for detachment. Full correction is the best antidote for progressive myopia. If vision deteriorates in spite of rest and constitutional treatment, and headaches and vitreous opacities develop, iridectomy is to be performed, to prevent detachment. In 362 cases of this sort with 10 to 35 D. of myopia, Dransart noted detachment in only 4 cases, all of which had neglected the usual hygienic precautions, so that he had 98% of successes. He prefers iridectomy to Fukala's operation which he has performed rarely and then only in one eye.

45. **Dacryocystitis of the new-born.** RAJA (Naples) advises against too early cutting of strictures and finds that antiseptic irrigation, instillations of protargol, and massage of the sac from above downward are generally effectual. If necessary, the puncta may be slit, according to Stilling, or an incision made into the sac. Probes may be passed later.

46. **Eserin and atropin in cataract extraction combined with flap.** ORTIN (Madrid) prefers atropin to eserin, as this prevents posterior synechiæ and secondary cataract formation.

47. **Corneal leucoma and vision.** BAUDRY (Lille) finds that the degree of incapacity caused by leucomata depends not only on their position, extent, and density, but largely on the occupation of the individual.

48. **Treatment of corneal opacities due to nitrate of silver.** MARQUEZ (Madrid) notes that these opacities may be partially cleared by means of 5% solutions of sodium hypo-

sulphite after scraping off the corneal epithelium under cocain.

49. **Cicatrizing power of picric acid in corneal lesions.** VALENTI (Rome) uses a 2% salve with good results, not only in conjunctivitis, but in serpiginous ulcer, superficial, phlyctenular keratitis, and lime burns, as well. Lachrymation and blepharospasm cease at once. As soon as cicatrization begins, this medication must be changed.

50. **Age and accommodation.** GIORDANO notes that the focussing power increases up to the age of twenty, and gradually fails after twenty-five. From the age of forty-five on there is no reserve of accommodation sufficient for fine near work. Accommodation, pupillary reaction, and convergence are synergetic functions.

50 *A*. **Designation of meridians in astigmatism.** PERGENS (Maesyck) discusses the history of this subject and advises the method of Laurence with the zero point at the upper end of the vertical meridian and the designation "nasal" or "temporal" to 90° at the horizontal.

51. **Intraocular enchondromata.** PES (Turin) found a deposit of cartilage in the choroid of an eye, which had been formed in the course of a chronic inflammation. There were no lime precipitates or ossification points.

52. **Regeneration of the optic nerve.** PARDO (Modena) observed this process after section of the optic nerve in Triton.

In the discussion, MARQUEZ (Madrid) reported that Ortin of Madrid had made similar experiments on dogs and cats with apparent success, but microscopic examination showed that this appearance was entirely misleading. Pardo, in closing, agreed that regeneration is impossible in higher vertebrates, but that it undoubtedly occurs in lower forms of animal life.

53. **Hemorrhagic glaucoma and allied forms.** ORLANDINI (Venice) made histological studies in 12 cases, showing the usual tissue changes. The etiological factor is generally some severe affection of the vascular system and heart, or, occasionally, diabetes. Operative treatment is not only useless, but dangerous.

54. **Syphilitic neuro-paralytic keratitis.** CABANNES (Bordeaux) found 33 cases on record. In acquired lues it is the result of an intracranial lesion of the fifth pair or of the Gas-

serian ganglion. The first symptom is generally facial neuralgia about the eye, with supraorbital and infraorbital tenderness, as an expression of trigeminal involvement. The corresponding side of the face, cornea, and conjunctiva are generally anæsthetic. Keratitis with hypopyon, or ulcer, is usual.

In hereditary lues, the neuralgia is not marked, and in tabes true neuroparalytic keratitis does not occur, although anæsthesia of the cornea has been observed. The common lesions in this affection are bulbar and nuclear, with secondary degeneration of the nerve trunk, but the Gasserian ganglion is but slightly affected, while true neuroparalytic keratitis is caused by syphilitic changes at the base.

55. **Keratitis of marble workers (marmarokoniasis).** TRANTAS (Constantinople) describes incrustation of the cornea with innumerable, very small, gray-white or red particles of stone which are situated beneath the epithelium, especially in the lid fissure area. They are more numerous in the left eye of right-handed workmen, and *vice versa*, occurring only in cutters of hard marble who have been in the quarries for a long time. Instillations of weak vinegar may be tried, therapeutically.

In the discussion, JACOVIDES (Alexandria) objects to the philology of the term marmarokoniasis, and notes the importance of accurate determination and designation of occupational diseases. COPPEZ (Brussels) has seen similar conditions in the Belgian granite quarries. The appearance of the cornea suggests the deposits in serous iritis.

56. **External oculomotor paralysis and optic neuritis after typhoid.** ANGIOLELLA (Luzern) reports 2 cases of abducens paralysis and one of optic neuritis probably due to toxæmia of typhoid. The neuritis was associated with, but not due to, increased intracranial pressure.

57. **Lens form of the vertebrates.** PFLUGK (Dresden) reports the results of a series of sections made with freezing microtome.

THIRD SCIENTIFIC SESSION, April 6, 1909.

58. **Etiology of trachoma.** CLAUSEN (Berlin) submitted drawings of the so-called trachoma bodies which he considers absolutely specific. They are most numerous in fresh,

untreated cases with large, gelatinous follicles, disappearing from the surface under the use of astringents, and being absent, more or less completely, in the cicatricial stage. Their presence or absence is positive evidence in the differential diagnosis of forms of conjunctivitis.

Discussion: ADDARIO (Palermo) is convinced that the so-called "trachoma bodies" are artefacts, composed of sedimented staining matter mixed with degenerated cells in the course of histological preparation. LODATO (Palermo) has seen these bodies in vernal catarrh, and is very skeptical as to the etiology of trachoma having been cleared up. GALLENGA (Parma) corroborates Clausen's findings. The bodies are present in the epithelial cells only. Trachoma is not communicable to lower apes. CLAUSEN, in closing, notes that his opponents, Addario and Lodato, have not submitted any microscopic specimens in support of their contentions. The bodies they describe are not identical with trachoma corpuscles, have been seen by him also, in various forms of conjunctivitis, and can be distinguished readily after some practice with the forms he describes as specific.

59. **Experiments on the relations of the anterior corpora quadrigemina.** LEVINSOHN reports experiments on apes and rabbits showing that the centripetal path for pupillary reaction is definitely known only as far as the external geniculate body, and that the subsequent course, particularly in relation to its connection with the oculomotor nucleus, requires further study. At all events, the entire corpus quadrigeminum including both brachia and the ventral layers of the tegmentum, extending to the base of the aqueduct, are not concerned in the contraction of the sphincter pupillæ to light.

60. **Enophthalmus in trochlearis paralysis.** FORTUNATO (Palermo) noted this symptom in a case of traumatic paralysis of the superior oblique with probable tear of the tendon, and believes the recession of the globe was due to the pull of the recti muscles.

61. **Relapsing vitreous hemorrhages and proliferating retinitis of tuberculous origin.** AXENFELD and STOCK (Freiburg) have found these conditions much more frequent than is usually believed. The hemorrhages due to tuberculosis of the vessel walls may develop without evident lesions of the iris or

choroid. In some cases there was an insidious uveitis with occasional tuberculous nodules, so small as to be seen only with the binocular loupe, in one eye, and in the other, signs of proliferating retinitis, succeeded after some time by relapsing hemorrhages into the vitreous. In other cases the relapsing hemorrhages were not associated with any manifestations of uveitis. The specific nature of the disease process was demonstrated by a positive reaction to tuberculin injections and by the conjunctival test. The prognosis is bad and treatment is limited to climatic cures at the seashore or in the mountains. The histological changes underlying the hemorrhages, although of tuberculous origin, need not show typical pictures of tuberculosis.

62. **Vitreous filtration and ocular osmosis in hemoglobinæmia.** WESSELY (Wuerzburg) reports experiments on rabbits showing that the albumins and antibodies of the serum enter even the intact vitreous in increased amount after the artificial causation of hyperæmia, although much more slowly and in smaller quantity than in the anterior chamber. In both cases, the ciliary processes supply the altered fluid. After artificial production of hemoglobinæmia, evacuation of the anterior chamber results in the production of intensely red aqueous, showing that the hemoglobin acts exactly like the antibodies and albumins.

63. **Punctate conjunctivitis.** FALCHI (Pavia) treated a girl of twenty-two who gave a history of malaria, typhoid, and pleurisy. Neuralgia of the first and second division of the trigeminus, with fever, was followed by an eruption of small white, later confluent, dots in the conjunctiva of the fornix, globe, and tarsus, which did not ulcerate. Relapses, limited to the right eye, were observed over a period of five years. Finally, the affection involved the left eye also. Histological examination showed beaker cells between the epithelia, with marked mitosis, numerous leucocytes, and some mast-cells in the subepithelial layer, containing yellowish granules and fat cells in the stroma.

Discussion: GALLENGA inquired as to the relationship between the fever and the conjunctival changes. OVIO suggested a syphilitic origin of the disease. FALCHI thought the results of staining showed that the process was a mixed

one with degeneration. Staphylococci and a few diplococci were found in cultures from the conjunctiva. There were no signs of syphilis in the skin or mucous membranes, and the conjunctivitis could not be connected with the fever. The affection is benign, recurs frequently in the first year, and can be treated with boric acid or bichloride applications, and the internal administration of quinin, iron, and arsenic.

64. **Thermocautery in sclerotomy.** FIPRI advises the use of the actual cautery in preference to the knife in making the scleral section to reduce tension. A sickle-shaped wire is used which is applied in the vertical meridian about 8*mm* from the limbus. After penetration, the opening is enlarged to within 4*mm* of the limbus.

Discussion: ADDARIO also prefers the cautery, which allows the sclera to be opened without injuring the uvea, and thus avoids prolapse of vitreous.

65. **Trachoma in the Abruzzi.** GIUSEPPE (Palombaro) gives statistics of the origin and distribution of this affection, showing that it is less frequent in the mountains than in lowlands.

66. **Ocular changes induced by atropin and eserin.** LUEDDE (St. Louis) studied these changes in man, apes, and dogs, and corroborates the findings of Hess and Heine that eserin, in contracting the pupil, opens up the iris angle, and thickens the anterior segment of the ciliary body, while atropin produces exactly opposite conditions. In atropinized eyes, also, he regularly found an empty space directly behind the zonula, and in some human eyes a decussation of the zonular fibres was noted which is very striking and constant in dogs' eyes.

67. **Modern artificial eyes.** COULOMB (Paris) discusses the history, manufacture, and materials of artificial eyes. A good prosthesis should have no rough edges, points, or irregularities of surface. The so-called "reform" eye is very fragile. He prefers ordinary shells with reinforced edges and specially smooth surface.

68. **Larva of sarcophaga carnivora 2c long, growing in the eye of a child.** DOLCET (Barcelona) extracted a larva of the gray carnivorous fly from the outer commissure of the right eye of a child, aged 17 months. It lay between the globe and the orbit and had evidently been carried to this point as an egg.

69. **Ptosis following subconjunctival injection.** PONS Y MARQUEZ (Madrid) noted a paralysis of the levator palpebræ superioris, which disappeared in a few days, after the injection of a solution containing cyanide of mercury and acoin. In place of the latter drug, which was probably responsible for the accident, he advised the use of cocain.

70. **Hæmatoxylin stain for elastic tissue.** MONESI (Parma) fixes in 5% bichloride for 5–10 hours, washes in iodin water for 2–3 hours, passes the sections through ammonium molybdite with a few drops of hydrochloric acid for 12–24 hours. After washing in distilled water for several hours, hæmatoxylin stain is allowed to act for several weeks. The method is recommended for showing the elastic tissue and fibres of the cornea.

71. **Traumatic granuloma of the iris.** ROCCHI (Cremona) found a copper splinter embedded in granulation tissue in the iris. Bacteriological examination failed to reveal any bacterial life whatever.

72. **Lymphatics of the lid and their drainage channels.** SAMPERI (Naples) found two systems, one superficial draining into the preauricular gland, and a deep set connecting with the submaxillary. The first set takes in the lymphatics of the upper lid and the outer third of the lower lid, while the inner two thirds and the internal rectus drain into the second set. But one main duct leads to the preauricular gland.

73. **Rationale of iridectomy in glaucoma.** HENDERSON (Nottingham) considers Schlemm's canal as a venous sinus which drains the entire uveal tract. Fuchs's crypts act similarly *via* the iris veins. Intraocular pressure is equal to the capillary pressure in the intraocular veins. Increase of tension is associated with an increased flow of aqueous into the veins. Drainage through the latter, a secondary venous channel, does not take place until pressure rises in Schlemm's canal. Sclerosis or obstruction of the iris angle alone will not produce glaucoma, but if the iris crypts are atrophic and can no longer perform their vicarious function, plus tension at once results. Iridectomy produces a wound in the iris which never heals, and presents a large number of open crypts for drainage. Furthermore, numerous fissures are produced in the iris and these, too, remain open. In chronic glaucoma with atrophy

and sclerosis of the iris tissue, the wound surfaces heal and no permanent effect is gained.

74. **Influence of ligating ureters on passage of fluorescin into the aqueous.** ANGELUCCI (Naples) found that this procedure in dogs delayed the diffusion of fluorescin into the fluid media of the eye by about one hour. Secretion of aqueous depends on blood pressure, secretory function of the epithelia of the ciliary processes, and, probably, other nervous influences, the nature of which is still unknown.

Discussion: SCALINCI (Naples) refers to his experiments, showing that destruction of the epithelium of the ciliary processes is immediately followed by complete cessation in the production of aqueous.

LODATO (Palermo) objects that these experiments are not conclusive, as the injections of sodium fluoride, used by Scalinci to destroy the epithelium of the ciliary processes, also injure the stroma, causing hemorrhagic and exudative processes, which fully explains the pathological changes in the aqueous.

75. **Influence of monochromatic light on oxidizing power of the retina.** GUGLIANETTO (Naples) notes that this power varies quite independently of the visual purple, but that it is closely related to the physical and chemical changes in the retinal elements. The retina of a frog, after exposure to light, has a higher oxidizing power than the dark-adapted eye, as determined by Lodato.

76. **Ocular disturbances due to atoxyl.** COPPEZ (Brussels) adds two cases to those already on record, in one of which complete blindness followed five injections of atoxyl, in one grain doses. In the other case, the external application of 10% atoxyl solution to syphilitic ulcers was followed by marked ocular injection and pain, and had to be discontinued.

Discussion: DE LAPERSONNE seconds Coppez's proposal to do away with the use of atoxyl altogether. SATTLER (Leipzig) reports three cases of blindness due to atoxyl in small doses. No ophthalmoscopic changes are found when the blindness first comes on, and the latter is progressive and final by the time the fundus lesions are noted.

LODATO and COPPEZ think the general practitioners should be warned of the dangers inherent in atoxyl, which are not generally known.

77. **Embryological anomalies of the human retina.** CASTALDI (Naples).

78. **Persistence of hyaloid tissues in the human eye.** CALDERARO (Palermo) made histological studies of the axial tissue of the vitreous, in regard to embryological development, and structure. So-called persistent embryonic vitreous rudiments are probably newly formed tissue in the same form as the embryonal variety. Anomalies of the hyaloid artery generally develop in the fifth or sixth month of intrauterine life, at the period when most syphilitic abortions take place.

79. **Comparative morphology of the fixed cells of the cornea.** VOLLARO (Naples) used an iron-hematoxylin stain to study these cells in different species and describes various peculiarities of the protoplasma processes and nucleus. The central portion of the cornea of small animals, *i. e.*, the visual area, contains much fewer cells than the periphery.

80. **Development of physiological excavation of the optic nerve.** SEEFELDER (Leipzig) notes that a funnel-shaped excavation develops at a very early period in embryos' eyes by separation of the nerve fibres, which varies greatly in size and form. This funnel may be entirely filled up or separated from the vitreous by proliferation of glia cells and formation of glia tissue in the vascular funnel. Later on, the change of position and absorption of the hyaloid artery and its glia sheath re-establish the communication of the primitive physiological excavation with the vitreous space, so that a small excavation which was completely filled up, at first, may in this way again become manifest. The so-called intercalary tissue (Schalt-Gewebe) on the floor of the excavation is in fœtal eyes, at least, composed entirely of glia elements. The mesodermal part of the lamina cribrosa is very slight up to the seventh fœtal month, and is almost imperceptible compared to the glia fibres.

81. **Radiotherapy in ophthalmology.** STEINER (Rome) notes that the intensity necessary to cause a reaction increases with the wave length, while all cells and tissues have the same receptivity for light of a single wave length. Ultraviolet rays are, accordingly, the most economical for therapeutic purposes. The bactericidal action does not extend to spores. The lens absorbs a large portion of ultraviolet rays and thus

acts as a protective screen for the retina, as for instance, against the intense sunlight in the mountains, but does not keep out X-rays well. The red long-waved rays of the spectrum are of use in lupus. Radium and the X-ray do not appear to have given satisfactory results.

82. **Almatëin in ophthalmic practice.** MORGANO (Catania) uses a 20% salve of this condensation product of hæmatoxylin and formalin. It has an antiseptic and cicatrizing action, especially in ulcerative keratitis, phlyctenula with pannus, and impetiginous blepharitis.

83. **Sympathetic irritation following melanosarcoma of choroid.** MENACHO (Barcelona) reports a case of severe keratitis with anterior atrophy. Increased tension and enlargement of the eye were followed by hemorrhages at the disk and lymphangitis of the fellow eye, which improved after enucleation which revealed telangiectatic sarcoma of the choroid.

84. **A new disease of the ciliary margin with a specific microbe.** PASCHEFF (Sophia) describes under the title of infectious, necrosing ciliary folliculitis 3 cases of a peculiar lid affection. Constitutional symptoms are marked and associated with swelling of the preauricular and submaxillary glands. Pustules appear on the lid margin, and the entire lid becomes red and brawny. Necrotic areas develop about the cilia. The affection lasts three or four weeks. Besides streptococci and staphylococcus aureus, Pascheff isolated a small, thick, rod-shaped organism with rounded ends, which was non-motile, negative to Gram, and grew on all media. It had neither flagella, capsule, nor spores. Cultures on fluid and solid media were constant and characteristic.

85. **Are the rods and cones directed toward or away from the source of light stimulation?** FERENTINOS (Patros) considers the pigment epithelium as the sensory epithelium, *sensu strictiori*. Under the influence of light, decided changes take place in this layer and are transmitted to the rods and cones, acting as a stimulus which is propagated by the light sense. The actual source of stimulation of the rods and cones is, accordingly, not light itself, but the altered condition of the sensory epithelium so that the retinal elements in question are really directed toward the source of their stimulation, as is the latter, *i. e.*, the pigment epithelium to the light itself.

86. **Primary tumor of the lachrymal sac.** BISTIS (Athens) reviews the literature of this subject and reports the development of a primary cancer of the sac in a seaman of sixty years. The tumor was as large as a hazelnut and was encapsulated in the thickened and fibrous sac wall, strands of which had grown into and through the tumor mass. After removal, recurrence took place.

87. **Metastatic blennorrhagic keratitis.** VAN LINT (Brussels) noted this condition in two cases of gonorrhœal urethritis, beginning with a double metastatic conjunctivitis. This was followed by involvement of several joints. Three weeks later, when the original symptoms had disappeared, there was an eruption of numerous pinhead-sized vesicles on one cornea which in the course of several days broke down into minute ulcers with starred radiating margins. There was marked photophobia but no circumcorneal injection. In five days there was complete cicatrization, and the cornea was found quite clear in fourteen days. In one eye, which had been sound, iritis developed a month later.

88. **Old detachment of retina cured by cataract extraction.** FOLINEA (Naples) reports a case in which sclerotomy, years before, had improved the condition in detachment. The latter was completely cured by the extraction of a complicating cataract, which encourages Folinea to advise surgical intervention in detachment which does not yield to medication.

DEMONSTRATION SESSION, April 5, 1909.

1. BIRCH-HIRSCHFELD (Leipzig) showed drawings and diapositives of microscopic sections illustrating the changes described by him (see No. 13).

2. SEEFELDER (Leipzig) demonstrated similar specimens of his cases.

3. WESSELY (Wuerzburg) **Experimental coloboma of lens in the growing eye,** was able to produce this anomaly by performing iridectomy on the eyes of new-born rabbits, 8–14 days old. This change, which comes on gradually in a week or two after the operation and resembles the condition in human beings, is due to operative injury of the zonule, allowing limited, localized diminution of traction on the lens capsule and consequent developmental anomaly. Complete opacification of the lens by massage is converted into

nuclear opacity by the growth of superincumbent layers of clear lens fibres, while discission of the capsule with marked swelling of the lens causes buphthalmus associated with enormous enlargement of the orbit.

4. CLAUSEN demonstrated microscopic specimens of trachoma bodies.

5. AMBERG (Lucerne). **Modification of Czapski's corneal microscope for measuring the depth of the anterior chamber.** After determining the radius of the cornea with the ophthalmometer of Javal, the latter is focussed on the pupillary margin, and by moving the light source the corneal image of the latter is likewise brought into the pupillary area. Knowing the distance of the light source from the pupillary plane, the depth of the anterior chamber can be calculated or read of from a scale. A special lighting apparatus is required.

6. **Electric lamp for ophthalmoscopy and general examination, after Koster-Siegrist.** AMBERG. Opal lamp giving pure diffuse illumination. Does not heat up after hours of use. Easily adjusted and regulated. Made in Bern.

7. **Plastic operation for total cicatricial ectropion.** ROLLET (Lyons) demonstrated Lumière plates of his method with two flaps with pedicle for each lid.

(a) **Artificial eyes.** GROSSMAN (Liverpool) discusses the history of ocular prosthesis and describes the latest improvements.

(b) **Astigmometer.** GROSSMAN uses a rod-shaped battery of lenses for retinoscopy and subjective testing and has devised a rotating optometer containing a complete set of cylindrical lenses.

DUTOIT demonstrates the curves mentioned in his communication.

**Hygienic lenses.** SCHANZ and STOCKHAUSEN (Dresden) note that ultraviolet rays are responsible for erythropsia, dazzling snow-blindness, electric ophthalmia and organic changes in the retina described by Birch-Hirschfeld. Euphos glass absorbs all the ultraviolet rays and may be used for lenses as well as for globes, chimneys, and electric light bulbs.

**International operative and diagnostic case-book for ophthalmologists.** HIRSCH (Halberstadt) demonstrates a register for eye cases.

**Ocular pest.** MIZUO (Osaka) showed microscopic specimens and described the hyperæmia and inflammation which are well known and traditional. The bacillus of pest grows abundantly in the reticular layer of the connective tissue and in the aqueous.

PARDO (Modena) demonstrated tritons in which the entire globe had been transplanted successfully.

REMY (Dijon) demonstrated a number of type combinations for his diploscope and showed how they are used in suspected simulation and in disturbances of binocular fixation.

KRUSIUS (Marburg) demonstrated an isochromatic pupil scale, consisting of a red ground glass disk with an aluminum disk of graduated holes, allowing the pupil to be measured by reflected or transmitted light. The scale is always of the same color as the pupil, thus avoiding a common source of error.

DE LIETO VOLLARO demonstrated specimens of the elastic fibres of the cornea.

**Modification of enucleation.** MENACHO (Barcelona) divides the recti muscles and then passes a suture through the insertion of externus and internus. This is knotted and used for fixation and traction.

DIMMER (Graz) demonstrated photographs of the fundus oculi.

THORNER (Berlin) shows stereoscopic photographs of the eye grounds.

CLOSING SESSION, April 7, 1909. On invitation by Kubly, St. Petersburg was chosen for the International Ophthalmological Congress in 1914. The following subjects were chosen for general discussion:

1. **Etiology of trachoma.** 2. **Nutrition of the eye.**

A committee was appointed to judge manuscripts submitted by the younger ophthalmologists in competition for the de Vincentiis medals, of which three are to be given to Italians, and four to foreigners.

# REPORT OF THE PROCEEDINGS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

By Mr. C. DEVEREUX MARSHALL.

An ordinary meeting of the Society was held at the Medical Society's Rooms, Chandos Street, W., on Thursday, October 21, 1909. Dr. G. A. Berry, the new President, occupied the chair.

Mr. N. Bishop Harman showed a new retractor for use in excision of the lachrymal sac, also two sisters with symmetrical discoid cataract. Mr. Brooksbank James showed a case with very unusual fundus appearances, and Mr. Herbert Fisher showed a case of marginal bilateral keratectasia. Mr. Grimsdale showed a case of retraction of the eyes associated with the act of winking.

The President then delivered his address. He was more and more impressed with the truth of the maxim "Quot homines tot sententiæ," and it was often educating and inspiring to realize the steps which had led to the great advances, and to get some idea of the manner of thinking and the surroundings of the authors. Nothing was so fascinating as the history of medicine. More than mere rediscoveries could be claimed for present advances; they were new and were logical deductions from carefully collected observations and experiments, not merely irresponsible speculations. The practical man was an empiric, but now the science of medicine had overtaken and greatly outstripped the art. There were many reasons for treatment lagging behind; practical therapeutics was one of the most imperfect of the arts. Surgery was perhaps least subject to individuality, and it was in that domain that the most advances had recently been made in

treatment. But the advances following upon antiseptic surgery had led to an over-confidence in, and too frequent recourse to, surgery, and that tendency was no doubt favored by the public. That, however, was a mere swing of the pendulum, and would right itself in time. The eye was an organ whose functional activity could be estimated with every refinement. The possibility of suggestion in treatment did not occur to most patients, and one sometimes received most congratulation from those for whom one was conscious of having done the least. There had not been anything commensurate with the advance of general surgery in the sphere of ophthalmology, though there had been greater skill, and the incisions had been cleaner than formerly. The eventual results of operations for cataract were probably the same in all cases. Dr. BERRY then entered into a historical retrospect of the methods of operating for cataract, and asked whether finality had yet been reached in the matter. He thought it would be admitted that something better was at least conceivable; there might be cure without operation, and even prevention altogether. And, useful as iridectomy was in the treatment of glaucoma, advance might yet be made in that respect. Nearly all the surgical interferences in use for trachoma had their prototypes in ancient times. The treatment which gave the best results in the more severe chronic cases was now often employed in cases where it became an unnecessary mutilation. Dealing with the incursion of the optician into the realm of ophthalmology, he deprecated that because he could not detect or appreciate underlying eye disease. Dr. Berry went on to speak of the history of the invention of spectacles, as well as of the history of mydriatics, which latter means he thought had been much abused. The advantages of inducing hyperæmia had long been known, and now Bier had placed the matter on a scientific basis. In conclusion, he said he was a believer in a great future for medicine, both preventive and remedial; treatment by sera and antibodies, and every stimulant form of remedy opened up a vast vista for the future.

Mr. PRIESTLEY SMITH read two papers: (1) **A note on the making of pedigree charts;** (2) **A pedigree of congenital discoid cataract.** The latter almost exactly confirmed Men-

del's law. The President and Mr. NETTLESHIP congratulated the author on his papers. Mr. Nettleship discussed Mr. Smith's proposals for recording pedigrees, and said the second paper dealt with the largest pedigree of that disease which had ever been recorded. Mr. R. W. DOYNE said he had observed "Coppock" cataracts for the last 26 years, and 25 years ago he worked out a long series of three generations, all of which were handed over to Dr. Ogilvie when he elaborated his paper. He had formed a rather strong suspicion that as the years advanced the cataract became more dense. In the "Coppock" cases the most advanced of all was one of three brothers and the faintest were in the young children. One girl, now a schoolmistress, he examined when she was quite a child, and saw her again recently, and he thought the condition had progressed. Mr. HERBERT FISHER said that recently a case of discoid cataract which was under Mr. Nettleship 16 years ago came to the hospital, and there was now no further deterioration in vision. Mr. TREACHER COLLINS questioned the advisability of using the term discoid cataract for these cases, as this form of cataract was known as the "Coppock." Discoid has been applied to the form of opacity in which the lens was flattened from before backwards. Mr. Priestley Smith, in reply, said it would be very useful if those following up the subject were to give the names of the people, as he believed there was a migration to towns, and some supposedly isolated cases might be shown to be connected.

An ordinary meeting of the Society was held at the Medical Society's Rooms, Chandos Street, W., on Thursday, November 11, 1909, Dr. G. A. BERRY, President in the chair.

Mr. SYDNEY STEPHENSON showed a case of pigment on the anterior capsule of each lens, probably representing a rare type of persistent capsulo-pupillary membrane. The President agreed with Mr. Stephenson's views. Dr. RAYNER D. BATTEN exhibited and demonstrated an instrument for the examination of the eye under water in the erect position, and showed its application as a means of treatment. In glaucoma, for instance, after removing the instrument, the haze of the cornea disappeared. He had not had any untoward incidents with it. Mr. DORRELL showed a case of choroidal degeneration.

Mr. W. M. BEAUMONT read a paper on **Oxycephaly,** illustrated by a number of lantern slides. He did not agree with Patry in considering that the term syndrome should be applied to the association of oxycephaly with optic neuritis or atrophy, as the nerve involvement was a secondary result which might or might not follow. Very considerable interest had been taken in the disease in recent years since the articles by MICHEL and VIRCHOW. A number of cases had been recorded in the United Kingdom, but he thought that the credit of first pointing out the clinical symptoms of oxycephaly was due to WM. MACKENZIE, of Glasgow. His description had strangely failed to attract the attention which it deserved. This keen observer had noted the shallowness of the orbits and the consequent exophthalmos, the vertical position of the roof of the orbits, the extreme height of the head, and the blindness.

Mr. BEAUMONT drew attention to the excess of males over females; in 14 cases recorded in recent British literature there were 5 females. In Patry's list, drawn from French and German sources, there were 7 females in 64 cases. The author disagreed with Dorfmann who advocated trephining to prevent optic atrophy, because he considered that the optic neuritis and atrophy were not due to an increase of the intracranial pressure, but rather were the result of direct injury by bony distortion. Patry had stated that Sir Walter Scott and others had suffered from a slight degree of this disease. If this were true it is possible that cases of arrested oxycephaly might be overlooked, and he threw out the suggestion that possibly sometimes so-called idiopathic optic atrophy might be due to a fruste form of oxycephaly.

Mr. BISHOP HARMAN said he had met with 6 cases in the London County Council Blind Schools, and had found the author's statement true, that they were not, as a rule, mentally defective. Mr. SYDNEY STEPHENSON recalled a case which was exhibited by Dr. James Taylor before the Society for the Study of Disease in Children, which had occipital meningocele and optic atrophy. Mr. BISHOP HARMAN read a paper on the **Measurement of the desire for binocular vision by means of the diaphragm test.** He said individuals showed variation in the sensibility of their cerebral functions. Color and light sense, smell, taste, and hearing all varied, and the muscle

sense that maintained body balance no less. There were extremes of mental defect and striking endowment, but within the so-called average capability there was also a wide range of variation. So far the capability for binocular vision had escaped a similar critical study. Our tests either determined the presence or absence of binocular vision, or were complicated—as in the use of prisms and stereoscopes—by muscle stresses which vitiated the results.

The diaphragm test was a pure test for binocular vision, and by a variation of its mode of application it was possible to measure the desire for binocular vision as easily as the stature or weight of a man could be ascertained.

The test cards seen through the hole in the screen of the test were viewed for their greater part by each eye separately, but a median band was seen by the direct vision of the two eyes together; this median band acted as a balancer to the eyes and their controlling mechanism, for this reason it was called the "ocular poise."

Experiments showed that different individuals, and the same individual under different conditions, required different breadths of ocular poise; the more perfect the binocular vision the narrower the ocular poise required to maintain the eye balance; hence the smallest measure of the ocular poise became the measure of the desire for binocular vision.

The standard pattern diaphragm test had a fixed hole in the screen of 17*mm*; the instrument to measure the ocular poise had a variable aperture. The aperture was varied by means of shutters which were moved by suitable gearing, the variation of the ocular poise was shown automatically upon a scale. The scale had a compensating adjustment for the varying width between the eyes of different subjects, so that the measures given by the test became truly comparative.

Examination of binocular vision by this means showed how essentially cerebral was the controlling mechanism of the eyes, how greatly it varied in different individuals, and how profoundly it was affected by conditions of ill-health and fatigue. There seemed little doubt that on these points the test opened up many possible fields for physiological and psychological enquiry.

To the ophthalmic surgeon the new test had a particular

value for those cases of occasional divergent squint with feeble convergence which were due to defective cerebral control. These were those for which at present we had been able to do but very little. With the variable aperture to the diaphragm test the ocular poise could be so large as to present an attractive point of binocular fixation; and with practice, control of the eyes might be developed, so that the balance could be maintained under conditions of gradually increasing difficulty.

**The measurement of hyperphoria by means of the diaphragm test,** by N. BISHOP HARMAN.

If a line of letters or figures be viewed through the hole in the screen of the diaphragm test, they appear in perfect order and alignment to the man with good binocular vision and balance. In the case of latent squint the order and alignment of the letters were altered. The line 123456789 would appear on two levels to the man with hyperphoria, in right hyperphoria thus: 12345

6789.

The displacement was found to be constant for equal degrees of divergence, and proportionate for different degrees. So as to be able to measure the degree of divergence directly, a test card had been prepared; one half bore a vertical tangent scale, the other a horizontal pointer. When viewed through the diaphragm test the scale was seen by one eye, the pointer by the other. When there was hyperphoria, the pointer was displaced from its neutral point and appeared shifted upwards or downwards according to the kind of hyperphoria, and rested at a level of the scale corresponding to the degree of latent squint. The degree indicated was the degree required in the correcting prism; or the same result could be obtained by measuring directly the decentralization of any glasses worn by the patient.

The President discussed the papers, and Mr. HARMAN replied.

# REPORT OF MEETING OF THE SECTION ON OPHTHALMOLOGY OF THE NEW YORK ACADEMY OF MEDICINE.

By Dr. JOHN R. SHANNON, Secretary.

MEETING OF MONDAY, OCTOBER 18, 1909. DR. W. E. LAMBERT, PRESIDENT, IN THE CHAIR.

Present, fifty members.

Dr. George H. Bell presented a patient from whose crystalline lens a piece of steel had been removed through the original opening in the cornea, with a resulting vision of $\frac{20}{40}$. The patient was first seen on August 10th. The afternoon before, a piece of steel had flown into his right eye. There was a perforating wound of the cornea, on the outer temporal side. Iris not incarcerated but slightly torn. There was great pain. With the Haab magnet the steel was drawn into the anterior chamber, and by means of the Johnson magnet it was removed from the anterior chamber through the original opening in the cornea. The anterior chamber was not lost. No instruments were used except the speculum and magnet.

The subsequent history of the case was uneventful, there being very slight opacity of the posterior surface of the lens. The steel was 2 *mm* x $1\frac{1}{2}$ *mm* in size, and triangular in shape.

Dr. Francis Valk presented a patient upon whose eye he had performed the operation of **transplantation of a rabbit's cornea.** Dr. Valk thought that the operation of keratoplasty ought to become a recognized surgical procedure in cases of necrosis of the cornea. The operation had been done for partial restoration of the vision, with indifferent results, but in this case the cornea was intended to replace a prominent staphyloma following an attack of inflammatory ulcer with firm tissue, resisting the intraocular pressure.

Dr. GEORGE S. DIXON presented and described an improved head-rest for localizing foreign bodies in the eye and orbit.

Dr. THOMAS R. POOLEY reported a case of **atypical exophthalmic goitre.** J. D., 57 years of age, a printer, was first seen April 11, 1908, at the New Amsterdam Hospital. Had worked steadily for thirty-nine years. Had a history of syphilis thirty years ago. Gonorrhœa twice. No sequelæ. Had taken alcohol intermittingly but had abstained since October, 1907. For two years he had had tachycardia. Pulse when recumbent 120. No murmur. Circulation fairly good. Has lately become restless. Suffers from insomnia and has lost weight. Eyes became prominent the previous October, the left becoming more so. Three weeks ago a swelling of the conjunctiva began in that eye and soon there was paraphimosis conjunctivæ. The cornea became ulcerated below and a hypopyon ensued. Adduction and abduction became limited. The thyroid was not enlarged. Temperature 98°, pulse 120, respiration 24. The protruding conjunctiva was incised, relieving the pain and swelling. Later external canthotomy was done and the lids stitched together. The right eye was irrigated with normal salt solution and bandaged at night. Internally, thyroid extract one grain three times a day was given, with digitalis, ten drops of ten per cent. solution three times a day, and sodium bromide at night. Subsequently, antithyroid was substituted for the thyroid extract. On April 25th the patient was very weak. Sulphate of spatteine one-quarter grain three times a day was given. The next day the cornea of the right eye became involved and the conjunctiva began to swell and protrude. Wet dressings and a light pressure bandage were applied. The mental processes were markedly disturbed at this time. On April 28th there was an acute thyroidism and the digitalis and bromide were stopped. Patient was weaker. On May 2d, the ulceration in the left eye having extended, the cornea ruptured and sloughed off and when the dressings were removed, the lens escaped; the right eye was much improved. Patient discharged May 4th. Since that date his condition has improved materially. In August, 1908, Dr. Rogers gave him five injections of antithyroid serum, one every

second day. The detoxicated extract of thyroid was also continued. These measures were fairly beneficial. Dr. Pooley called the case one of atypical exophthalmic goitre, first, because of the absence of enlargement of the thyroid; second, because of the very unusual swelling and protrusion of the conjunctiva, and third, because of the severity of the nervous and mental symptoms. He had not been able to find record of another case where the eye had been lost in this disease, although Hare's *Practice* related a case almost exactly similar in the other respects. Dr. Pooley commended the Rogers serum tablets in this case, and advised complete rest. The present state of the patient is as follows: Eyes prominent, left equally so with the right. There was no general infection in the left eye. Vision, right: $\frac{20}{30}$, with correction. Pulse 84, muscular tremors much less pronounced. General condition otherwise much improved.

Dr. H. W. WOOTTON read a paper entitled **The surgical treatment of trachoma by means of the combined excision of Heisrath and the tarsal resection of Kuhnt** (to be published in full in the ARCHIVES OF OPHTHALMOLOGY). He exhibited five cases illustrating the combined excision and five others upon whom the tarsal resection had been performed. Of the cases of combined excision, three had been operated upon during June and July, the other two quite recently. Of the three former, two had suffered from inveterate and recurrent pannus and were apparently cured, as was likewise the third in which, however, there had been no complicating keratitis. The two more recently operated upon illustrated the usual appearance of severe cases, the one ten days, and the other three weeks, after operation. In both, granulation tissue was present in the track of the excision in the lower lids and was being repressed by means of caustics. In none of these examples of the combined excision was there the slightest restriction of the rotation of the globes, and in one a pre-existing ptosis had been corrected. The five cases illustrating the tarsal resection had all suffered from pannus at the time of the operation and, in three, the keratitis had been aggravated by entropion. They had been operated upon at various times during the summer, the most recent case during the early part of September. In all,

the keratitis had ceased and the vision had been markedly improved, in one, from the ability to count fingers at a few inches, to better than $\frac{20}{200}$. The entropion had been perfectly corrected in the three cases in which it had previously existed. In one of the cases of tarsal resection, the result was quite remarkable. The patient, according to his own statements, had suffered from trachoma for four years and had been out of employment on this account for over a year. For four months he had suffered from aggravated blepharospasm, photophobia, and lachrymation, due to a superficial pannus in the left eye. The case was in the beginning of the cicatricial stage, the follicles having entirely disappeared. A tarsal resection was performed June 5th. All irritative symptoms disappeared two days later. The sutures were removed on the fifth day and the patient left the hospital on the seventh. On the eleventh day he resumed his former occupation and has been at work continuously ever since with no recurrence of any of his symptoms.

Dr. Bell's case was discussed by Drs. LAMBERT, EMERSON, MARPLE, LEWIS, and CLAIBORNE. Dr. LEWIS, several years ago, before the days of the giant magnet, had reported a case of a piece of iron in the lens. The vision was $\frac{20}{10}$ two weeks before the injury to the eyeball. Patient was seen six years later, and the condition remained the same. In Dr. EMERSON's case, a piece of nail remained in the lens quietly for six months, with a vision of $\frac{20}{40}$, but later the lens became opaque and was extracted.

Dr. Valk's case was discussed by Drs. COBURN, LAMBERT, and POOLEY. Dr. POOLEY did not consider that there was any great improvement from using this operation, as Nature would heal up an ulcerated cornea equally well. In reply to a question, Dr. Valk described von Hippel's trephine and its method of use.

In the discussion on Dr. Pooley's case, Dr. MARPLE had had a patient who was very much improved by the Rogers serum. Dr. LESZYNSKY had never seen such a case before. Visible presence of a goitre is not essential in Graves' disease. Graves' disease is a better term than exophthalmic goitre for these cases, and in their treatment, rest is the essential element. The case was also dis-

cussed by Drs. JOHNSON, LAMBERT, POOLEY, and CLAIBORNE.

In the discussion of Dr. Wootton's paper, Dr. WEBSTER said that these measures are not indicated in the trachoma of children, which, as a rule, can be relieved by expression and drug treatment, but in the old chronic cases with pannus, incurved cartilage, etc., everything has been tried and failed, and this operation comes nearer to being a cure than anything yet done. Those who have performed the operation are enthusiastic about it. In one case of his, which was the second case that Dr. Wootton had operated upon, the eyes were so irritable that the man could scarcely open them. After the operation, vision increased from $\frac{8}{10}$ to $\frac{10}{10}$ and with both eyes $\frac{20}{10}$. One of its remarkable results is its cure of entropion and trichiasis. Dr. CLAIBORNE did not think that it had been proved that the operation cures trachoma. Dr. MARPLE had always had a prejudice against an operation which had for its object the removal of the conjunctiva, but thought, however, that Dr. Wootton had been conservative, avoiding the furor operandi. He thought this operation should be fully tested.

Dr. PARKER related a severe case which had been treated in every possible way without result. The man was now at work for the first time in years. His pannus has disappeared and his eyes are comfortable. He thought that one such case as that was sufficient justification for the operation under similar circumstances. Dr. COHEN said that the operation failed to obliterate all the infectious element. Nevertheless he approved of the operation. Dr. POOLEY thought that you could not eradicate the possibility of a reinfection by this operative measure.

# SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE THIRD AND FOURTH QUARTERS OF THE YEAR 1908.

By Dr. G. ABELSDORFF, in Berlin; Prof. St. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Prof. CIRINCIONE, Genoa; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Mr. C. DEVEREUX MARSHALL, London; Dr. H. MEYER, Brandenburg; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and others.

Translated by Dr. MATTHIAS LANCKTON FOSTER.

Sections I.–III. Reviewed by Prof. C. HORSTMANN, BERLIN.

## I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

460. PETERS, A. *Congenital Defects and Diseases of the Eye.* Bonn, Friedrich Cohn, 1909.

461. DE RIDDER, PAUL. **Examination of the eyes in the schools of Brussels.** *Annal. d'ocul.*, cxl., p. 27.

462. MCCALLAN, A. F. **Ophthalmic conditions in the government schools in Egypt and their amelioration.** *Ophthalmoscope*, Nov. and Dec., 1908.

PETERS (460, **Congenital defects and diseases of the eye**) gives a comprehensive survey of the congenital defects and diseases of the eye which are scattered in different places in most text-books. The malformations need a revision, because during the past years a great revolution has taken place in regard to their etiology, indicating that intrauterine inflammations play no important part, while the importance of heredity has been brought more into the foreground. Congenital disturbances are not considered alone among the

defects and diseases of the new-born eye, but some troubles that appear later as well, because the rôle played by heredity is strikingly shown in these cases.

DE RIDDER (461, **Examination of the eyes in the schools of Brussels**) examined 2820 school children between the ages of six and fourteen and found 21.5% hypermetropic, 16% myopic, and 9% astigmatic. BERGER.

MCCALLAN (462, **Ophthalmic conditions in the government schools in Egypt and their amelioration**). This paper should be read by those interested in the great work the Egyptian Government is carrying out in Egypt, a work which, thanks to the skill, energy, and organizing power of Mr. McCallan, the director of the department, has already accomplished useful results. The paper does not lend itself to abstraction. T. HARRISON BUTLER.

## II.—GENERAL PATHOLOGY, DIAGNOSIS, AND TREATMENT.

463. HERTEL, E. **Studies concerning the electric conductivity of the eye.** *Arch. f. Ophthalmologie*, lxix., No. 1, p. 126.

464. LOEHLEIN, W. **The action of biliary acid salts upon gonococci.** *Klin. Monatsbl. f. Augenheilkunde*, xlvi., ii., 5-6, p. 522.

465. FISCHER, TH. **Contribution to the action of Pfeiffer's influenza bacillus.** *Klin. Monatsbl. f. Augenheilkunde*, xlvi., ii., 4, p. 374.

466. WERNKE, TH. K. **The action of thyreotoxin upon the eye.** *Westn. Ophthalm.*, 1908, No. 6.

467. MAYOU, S. **Some staphylococcal infections of the eyes and their treatment with vaccine.** *Ophthalmoscope*, August, 1908.

468. AUBINEAU. **Symptoms and complications of the ophthalmo reaction from tuberculin.** *Annal. d'ocul.*, cxxx., p. 1.

469. SELIGMANN. **The consequences of Calmette's reaction and the prevention of the same.** *Zeitschrift f. Augenheilkunde*, xx., p. 130.

470. BOVAL, H. **Contribution to the criticism of the ophthalmo reaction.** *Weiner klin. Rundschau*, 1908, No. 40.

471. SCHUETZ, A. and VIDEKY, R. **The connection between exudative phlyctenular diseases of the eye and tuberculosis, together with experiences concerning the value of subcutaneous tuberculin diagnosis.** *Wiener klin. Wochenschrift*, 1908, No. 37.

472. WOLFF-EISNER. **The signification of the conjunctival reaction from 4000 clinical observations.** *Muenchener med. Wochensch.*, 1908, No. 45.

473. BUTLER, T. HARRISON. **The dangers of Calmette's reaction.** *British Medical Journal*, Aug. 8, 1908.

474. LABARIDTE, E. G. **Ophthalmo reaction with tuberculin.** *Wratschebn. Gaseta*, 1908, No. 41.

475. FINKELSTEIN, L. A. **The conjunctival and the cutaneous reaction of tuberculin.** *Russk. Wratsch.*, 1908, No. 13.

476. HINDESS, A. J. **The tuberculin reaction in children.** *Wratchn. Gaseta*, 1908, No. 4.

477. DEUTSCHMANN. R. **On serum therapy in diseases of the eye.** *Ophthalmoscope*, December, 1908.

478. ROCHON-DUVIGNEAUD. **Amblyopia following iodoform poisoning.** *Soc. d'ophtalm. de Paris*, Nov. 3, 1908.

479. AGABABOW, A. G. **Enucleation of the eye.** *Kasansky Med. Journ.*, July and August, 1908.

480. MUELLER, L. **Resection of the eyeball.** *Wiener klin. Wochensch.*, 1908, No. 49.

481. DE RIDDER. *Lumbar Puncture in Ocular Diseases.* Brussels, 1908.

482. SCHANZ, J., and STOCKHAUSEN, K. **The action of ultraviolet rays upon the eye.** *Arch. f. Ophthalmologie*, lxix., No. 3, p. 452.

According to HERTEL (463, **Studies concerning the electric conductivity of the eye**), the specific conductivity of a body is inversely proportional to its specific resistance. The conductivity of the aqueous is the same as that of the serum of the same animal after deduction of the influence of the albumin contained in it. The conductivity of the aqueous is reduced by puncture of the anterior chamber and by inflammation, probably because of the tendency of the changed aqueous toward coagulation. In individuals of the same species the conductivity of the globe fluctuates within narrow limits. It is not changed by inflammatory processes, while opening of the sclera increases it markedly.

The fatal effect of the biliary acid salts upon gonococci is pronounced according to LOEHLEIN (464, **The action of biliary acid salts upon gonococci**). The experiment showed that a 1% solution exerts a marked action in this way, and that a 10% solution rendered the plates nearly free from germs.

FISCHER (465, **Contribution to the action of Pfeiffer's influenza bacillus**) demonstrated Pfeiffer's influenza bacilli in the pus from an eye exenterated on account of panophthalmitis. The cultures introduced into the eye, particularly the vitreous, excited severe inflammation. The influenza bacilli multiplied greatly in the vitreous and were cultivatable in large masses after a few days.

WERNKE (466, **The action of thyreotoxin upon the eye**) concludes from his experiments that not only the cell toxin

from the tissues of the eye, but cell toxin from other organs, produces a toxic effect when injected into the eye.

HIRSCHMANN.

MAYOU (467, **Some staphylococcal infections of the eyes and their treatment with vaccine**) has treated a large number of cases of staphylococcal infections of the eye with a mixed vaccine prepared by the Jenner Institute. When this preparation proved inactive, a vaccine made from the patient's own local lesion was employed. In most of the cases the opsonic index was watched, but Mayou thinks this is unnecessary, if the initial doses be small. The danger of an overdose is an exaggeration of the local condition with a prolonged negative phase.

**Extraocular lesions,** such as acne, boils and styes, phlyctenulæ with styes, and tarsal cysts, were treated with varying success. Practically in every case there was a temporary improvement.

As regards **intraocular lesions,** there can be no doubt that the staphylococcus albus plays a part in the production of suppurative inflammation, but proof is wanted that the organism is the cause, or one of the causes, of non-suppurative irido-cyclitis. Mayou has treated such conditions with the vaccine with favorable results. He agrees that his cases are at present too few to yield any permanent conclusions as to the real value of the treatment.

T. HARRISON BUTLER.

According to AUBINEAU (468, **Symptoms and complications of the ophthalmo reaction from tuberculin**), the ophthalmo reaction appears in mild, moderate, severe, and complicated forms. The complications are rare and generally benign. They are comparatively frequent with old or fresh injuries of the eye.

SELIGMANN (469, **The consequences of Calmette's reaction and the prevention of the same**) instilled a drop of a ½% solution of the original Calmette preparation into the eye of a woman twenty years old. By evening a severe inflammation was present. After seven days there was still a considerable secretion of pus, and there were several broad phlyctenulæ on the corneal margin, with smaller nodules between them. On the bulbar conjunctiva there were a number of

yellowish nodules. Five weeks later, many nodules could still be seen in the conjunctiva, as well as punctate spots in the cornea.

According to BOVAL (470, **Contribution to the criticism of the ophthalmo reaction**), there is no doubt that the ophthalmo reaction is often accompanied by severe symptoms. He recommends that hereafter a freshly prepared 1% solution of old tuberculin should be exclusively used, and that accurate observations be made with this with a large amount of material to determine whether this valuable diagnostic means may finally be given into the hands of the practising physician.

SCHUETZ and VIDEKY (471, **The connection between exudative (phlyctenular) diseases of the eye and tuberculosis, together with experiences concerning the value of subcutaneous tuberculin diagnosis**) find that a part of the phlyctenulæ are certainly not of tuberculous origin. The differentiation of the etiology is important both diagnostically and therapeutically, for the tuberculous heal quicker under tuberculin, while the others need a corresponding diathetic treatment.

According to WOLFF-EISNER (472, **The signification of the conjunctival reaction from 4000 clinical observations**), the positive conjunctival reaction indicates active tuberculosis. Its appearance in the clinically healthy is strongly suspicious. A negative result with manifest tuberculosis is prognostically unfavorable. Negative reactions are always more frequent with the extension of the disease. No conclusion as to a favorable prognosis can be drawn from a positive conjunctival reaction, but only from the so-called cutaneous constant reaction.

BUTLER (473, **The dangers of Calmette's reaction**). Three cases are recorded in which perfectly normal eyes in children suffering from tubercle of joints did very badly. All took months to recover, and in one case interstitial keratitis developed with a centrally placed corneal ulcer. This case was strictly comparable to one recorded by Knapp in this Journal (March, 1908). In consequence of these shocking results and the uncertainty of the test, Butler has abandoned it in favor of subcutaneous injection.

T. HARRISON BUTLER.

LABARIDTE (474, **Ophthalmo reaction with tuberculin**) comes

to the conclusion that Calmette's test gives positive results in all cases in which there is the slightest trace of tuberculosis in the organism. In very advanced tuberculosis and great exhaustion of the organism no reaction is produced. The reaction is more intensive in the early stages of tuberculosis. No complications on the part of the cornea and conjunctiva were observed. HIRSCHMANN.

FINKELSTEIN (475, **The conjunctival and the cutaneous reaction of tuberculin**) gives preference to the skin reaction (Pirquet) as practically more convenient. Regarding the diagnostic value of both, he holds the same view as others, that it is of real importance only in early life. Later the negative reaction has a greater importance than the positive.
HIRSCHMANN.

The results of the work of HINDESS (476, **The tuberculin reaction in children**) are formulated thus: 1. The reaction is without danger to the sound eye. 2. The reaction is purely local and induces no general symptoms. 3. The positive result indicates the presence of tuberculosis in the organism. 4. The reaction does not usually take place in children under one year of age. 5. In cases in which a positive result is to be expected, weak solutions of tuberculin (½%) should be used, in other cases a 1% solution. In children the ocular reaction is to be preferred to the injection test.
HIRSCHMANN.

DEUTSCHMANN (477, **On serum therapy in diseases of the eye**). The author should have headed his paper "On Serum Therapy," "On Therapy with my 'Heil Serum,'" for he does not mention any other serum. Deutschmann brought out his serum in 1907; it is the serum of rabbits or horses which have been fed upon yeast; it is neither bactericidal, nor does it contain antitoxins; it has no opsonic activity; it has been extensively tried, and most authors find it inactive but harmless. In this paper the author quotes all the favorable reports, and gives further instructions as to its use. The original paper appeared in the No. 19 of the *Münchener medicinische Wochenschrift*, 1907. Further experiments were detailed in the *Beiträge zur Augenheilkunde* (reviewed *in extenso* in *The Ophthalmoscope*, 1907, p. 755). A critical study of this latter paper leads to the conclusion that the

healing power of the serum must be accepted with great caution. T. HARRISON BUTLER.

ROCHON-DUVIGNAUD (478, **Amblyopia following iodoform poisoning**) reports the case of a young man in whom, after puncture of a cold abscess in the inguinal region, iodoform and glycerin were injected so that from 6 to 7 *gms* of iodoform were absorbed. The general symptoms of iodoform poisoning lasted ten days. Visual disturbances with optic neuritis appeared six weeks after the injection. The fundus became normal again, but a marked contraction of the visual field and a central scotoma for red and green persisted.

BERGER.

AGABABOW (479, **Enucleation of the eye**) prefers enucleation to any method for diminishing the size of the globe. He recommends enucleation of an atrophied globe even when perfectly painless, because the irritation produced by an artificial eye sometimes causes pain and inflammation which results in sympathetic inflammation. He rejects the introduction of glass balls and other substances into Tenon's capsule for the purpose of forming a better stump for the prothesis. To obtain a movable stump, he unites the superior and inferior recti by a suture passed through their tendons and the conjunctiva, and the external and internal recti by another suture. HIRSCHMANN.

Resection of the globe should take the place of enucleation in many cases according to MUELLER (480, **Resection of the eyeball**). His method is to remove the posterior segment of the sclera together with the uvea. The anterior segment of the sclera together with the cornea is then replaced. The attachment of the four recti muscles and of the conjunctiva to this portion of the globe remains undisturbed. To obtain room for the performance of the resection, a short incision is made in the conjunctiva between the cornea and the inner canthus, and the attachment of the internal rectus to the sclera is temporarily divided.

According to DE RIDDER (481, **Lumbar puncture in ocular diseases**) the composition of the cerebro-spinal fluid is not influenced by disease of the eye or of the optic nerve, but pathological changes associated with similar changes in the eye must be ascribed to one and the same pathological process.

In many eye diseases lumbar puncture furnishes a basis for an early etiological diagnosis. For this purpose an exhaustive examination of the cerebro-spinal fluid and a comparison of the results with the clinical symptoms are necessary.

According to the studies of SCHANZ and STOCKHAUSEN (482, **The action of ultraviolet rays upon the eye**), the ultraviolet rays cause a fluorescence of the lens. The condition is not that of a transformation of ultraviolet rays into rays of different wave lengths in the visible spectrum, but a making visible of ultraviolet rays of 400 to 350 *mm* wave lengths. Erythropsia is to be looked upon as a pathological effect of the ultraviolet rays. Scotomata for red and green near the fixation point and disturbances in the lens have also been observed. Externally the ultraviolet rays produce electric ophthalmia in its most marked form.

## III.—REMEDIES AND INSTRUMENTS.

483. MICHAILOW, P. E. **Some new formulæ in ophthalmology.** *Wojenno Med. Journ.*, Dec., 1908.

484. ISCHREYT, G. **Modern remedies in ophthalmology.** *St. Petersburger med. Wochenschrift*, 1908, No. 35.

485. FORSELIUS, C. O. **Action of large doses of aspirin in various diseases of the eye.** *Hygiea*, 1908, p. 882.

486. HENDERSON, E. E., and PARSONS, J. H. **The action of cocain on the pupil.** *Ophthalmic Review*, Nov., 1908.

487. POLLOCK, W. B. INGLIS. **The advantages of paraffin as an embedding material in eye pathology.** *Ophthalmic Review*, Sept., 1908.

488. NAPP, O. **Brief review of the results obtained in the University Eye Clinic at Berlin with Deutschmann's serum.** *Zeitschrift f. Augenheilkunde*, XX., No. 1.

489. HARMAN, BISHOP. **Glycerin as an adjuvant to silver nitrate.** *British Medical Journal*, Sept., 12, 1908.

490. EVANS, J. JAMESON. **The construction, technique, and theory of Remy's diploscope.** *Ophthalmoscope*, Dec., 1908.

491. BERGER, E. **The use of the stereoscope in the examination of the central visual acuteness.** *Rev. générale d'ophtalm.*, XXVIII., p. 481.

492. BARDSLEY, P. C. **A new scotometer.** *Ophthalmoscope*, Nov., 1908.

MICHAILOW (483, **Some new formulæ in ophthalmology**) has compared the results obtained in various diseases of the eye by means of treatment with the usual remedies, such as zinc sulphate, copper sulphate, silver nitrate, atropin, etc.,

and with the use of adrenalin, alypin, anæsthesin, argyrol, collargol, tigenol, and zinc sozoiodolate. He finds that solutions of adrenalin 1:1000 and 1:2000 do not stop hemorrhage during operations on the lids. Used in conjunction with eserin it arrests an attack of acute glaucoma quicker than eserin alone. Alypin is more convenient than cocain for the removal of foreign bodies. Anæsthesin is but slightly soluble in water and in oily solutions is inconvenient during operations. The effect of solutions of argyrol is inferior to that of silver nitrate, except that in dacryocystitis injections of 20 or 25% solutions of argyrol are more efficacious than those of a 1:50 solution of silver nitrate, or a 10% to 15% solution of collargol. Thigenol ointment is useful in the squamous form of blepharitis. In chronic conjunctivitis and follicular catarrh a 5% solution of collargol is more efficacious than a zinc solution, but in trachoma collargol is inferior to silver and copper. HIRSCHMANN.

ISCHREYT (484, **Modern remedies in ophthalmology**) recommends hydrogen dioxide as a disinfectant and the organic silver salts, protargol, argyrol, and collargol, as astringents in the acute stage of purulent conjunctivitis; in other stages silver nitrate is the best remedy. He recommends citrate of copper for trachoma, airol for blennorrhœa. Adrenalin and suprarenin are anæsthetic, hæmostatic, and contract the blood-vessels. Dionin relieves pain and puts the lymph in motion. Jequiritol must be used with care. He does not pass judgment on the newer mydriatics, eumydrin, methylatropinbromid, and euphthalmin. Stovain, novocain, and alypin are recommended as substitutes for cocain.

FORSELIUS (485, **Action of large doses of aspirin in various diseases of the eye**)reports the results obtained from the diaphoretic action of aspirin in certain eye diseases in the ophthalmic clinic at Upsala since 1904. The patients received within two hours 6*g* of aspirin divided into three doses, and at the same time were placed in a wet pack until an hour after the last dose. The diaphoresis ranged from 600 to 1500 *g*. Good results were obtained from the treatment in cases of irido-cyclitis, secondary glaucomatous iritis, retrobulbar neuritis from chilling, and hemorrhages into the anterior chamber. In sclero-keratitis, paralyses of the ocular muscles

of neuritic origin, hemorrhages into the vitreous, and retinal detachment the results were uncertain. HELLGREN.

HENDERSON and PARSONS (486, **The action of cocain on the pupil**). The authors have repeated Jessop's classic experiments made in 1885 upon the action of cocain on the pupil, and they confirm his results. In a rabbit *2cm* of the left cervical sympathetic was removed. Next day both pupils reacted to light. The right was *8mm* in diameter, the left *5m*. Repeated instillations of cocain into the conjunctival sac caused the right pupil to dilate to *11mm* but produced no effect upon the left. The reaction was tested at intervals of days and weeks with the same result. The corpora quadragemina were stimulated by Sir Victor Horsley. Stimulation of the left anterior corpus caused no effect, stimulation of the right caused the right pupil to dilate. In a second rabbit the left superior cervical ganglion was removed. Next day the right pupil measured *9mm*, the left *5mm*. Cocain dilated the right to *12mm*, but had no action on the left. A similar result was obtained in a cat. The results are permanent, at least for over two years. It is difficult to explain the phenomenon. T. HARRISON BUTLER.

POLLOCK (487, **The advantages of paraffin as an embedding material in eye pathology**). The author gives a clear account of his histological methods and shows what an excellent medium paraffin is for embedding eye tissue for microscopical sections. He contrasts paraffin with celloidin to the advantage of the former. T. HARRISON BUTLER.

NAPP (488, **Brief review of the results obtained in the University Eye Clinic at Berlin with Deutschmann's serum**) reports 15 patients with infectious eye diseases, especially pneumococcus infections, treated with Deutschmann's serum. Aside from harmless exanthemata no harm was observed, and but little healing influence was demonstrated. The diseases ran their clinical course without shortening.

BISHOP HARMAN (489, **Glycerin as an adjuvant to silver nitrate**). Silver nitrate applied to the conjunctiva is sometimes very painful. The author thinks that the addition of 15% of pure glycerin renders this pain less intense, and it is said to favor penetration of the agent.

T. HARRISON BUTLER.

EVANS (490, **The construction, technique, and theory of Rémy's diploscope**). The diploscope of Rémy is described and illustrated by a diagram of the instrument. It demonstrates diplopia, suppression, etc. It demonstrates and measures heterophorias. It can be used to expose malingerers, to treat squints orthoptically, and it controls the choice of glasses for ocular deviations. T. HARRISON BUTLER.

BERGER (491, **The use of the stereoscope in the examination of the central visual acuteness**) recommends the binocular test by means of the stereoscope to determine the central vision of weak-sighted eyes. As the better eye is approached to the correct presentation of the worse in the visual line it can be determined what vision the worse has in the binocular act. Particularly with circumscribed central opacities of the optic media, especially of the cornea, and circumscribed changes in the central zone of the retina, an eye may show relatively good vision by the usual tests and yet prove deficient by the stereoscopic test. To test the vision Berger uses two black squares on a white ground, while another black square serves to fix the better eye. The three squares are so arranged that their union will resemble a checker-board. With good vision in both eyes there will be a rolling movement of one eye to avoid diplopia and fuse the lower square with one of the upper ones. When one eye is weak-sighted only one square will be seen distinctly, while the two seen with the bad eye will appear as dark gray spots. A series of stereoscopic charts has been constructed which show the minimum angle at which these two spots appear to be separated from each other. If the angle is 1° the vision is $\frac{1}{60}$, if it is 1′ the central vision is 1. This method of determination of the central vision affords the advantage over test types that confusion of the central vision with the sense of form is excluded. This stereoscopic test is necessary: (1) when it is suspected that differences exist between the central vision and that found by the test types; (2) when stimulation is suspected; (3) with much reduced vision when the usual test is insufficient; (4) with persons who cannot read, and young children. It is contraindicated with deviations of the eyeball and existent central scotoma. It is chiefly useful for the observation of visual disturbances after injuries and to test the vision of recruits. BERGER.

BARDSLEY, (492 **A new scotometer**) has invented a new scotometer, a miniature Bjerrum's screen, which was shown to the English Ophthalmological Society and highly commended.

The patient gazes into the dull blacked section of a hollow sphere along which a small test object slides along a narrow slot. The sphere rotates, and a scotoma can be mapped out. The instrument can be obtained from Meyrowitz.

T. HARRISON BUTLER.

Sections IV.–VII. Reviewed by DR. ABELSDORFF, BERLIN.

IV.—ANATOMY.

493. SPECIALE-CIRINCIONE. **The development of the human lachrymal gland.** *Arch. f. Ophthalmologie*, xlix., No. 2, p. 193.

494. WOLFRUM, M. **Origin and insertion of the fibres of the zonula in the human eye.** *Ibid.*, lxix., No. 1,.p. 145.

495. JUSELIUS, EMIL. **The development of the posterior pigment epithelium of the iris from the secondary optic vesicle, and its relation to the musculature of the iris and to spontaneous iris cysts.** *Klin. Monatsbl. f. Augenheilkunde*, xlvi., ii., No. 1, p. 19.

496. SCHREIBER and SCHNEIDER. **A method for the demonstration of pigments and of their colorless precedents, with special reference to the pigments of the skin and eye.** *Muench. med. Wochensch.*, No. 37, 1908.

497. GOEZ, A. **Study of lachrymal glands at different periods of life.** *Inaug. Diss.*, Tuebingen, 1908.

498. VAN DUYSE. **Cyclopia with cryptophthalmos and colobomatous cyst.** *Archives d'ophtalmologie*, xxix., p. 65.

According to SPECIALE-CIRINCIONE (493, **The development of the human lachrymal gland**) the lachrymal gland appears in the human embryo in the tenth week, beginning with proliferations of ectoderm from the conjunctiva which arise in the upper part of the outer conjunctival fornix. The separation of the gland into two parts begins in the embryo of 38*mm*, in which the lateral tendinous expansion of the levator and of Tenon's capsule furnishes some fibres for the formation of a fibrillar septum along the course of the gland cords that divides the cords into two unequal parts. In embryos of 60*mm* the division of the gland is complete; the orbital portion is formed by the ramification of the oldest primordial follicles

which have developed behind the interglandular septum, the lid portion by ramifications of the same follicles which have developed in front of the septum and also by ramifications of the same primordial vesicles which have developed later and remain in this portion. The structure of the gland vesicle at first is composed of large polyhedric cells with round nuclei; the peculiar formation begins with the dissolution of the central cells which leave behind an open lumen; after this the wall of the tube is composed of two well-differentiated layers of cells, the layer of secreted cells and the layer of basal cells.

WOLFRUM (494, **Origin and insertion of the fibres of the zonula in the human eye**) states that the zonula fibres of men and monkeys starting on the inner margin of the ciliary epithelium split into fine fibres and then penetrate deeply into the protoplasm and are inserted into the continuation of the limitans externa between the pigmented and the non-pigmented ciliary epithelium. Thus not two, but only one row of cells, separate the insertion of the zonula fibres from the true muscle. All the zonula fibres do not follow this intracellular course; a portion extend into the vitreous (Salzmann). The anterior and equatorial zonula fibres are inserted in groups into the lens; the half bundles coming from the ciliary portion unite to form whole bundles, one of which goes to the anterior surface and one to the equator. The division into bundles at the insertion into the lens brings about the ledge formation described by Rabl. The separation into bundles of the fibres that go to the posterior surface of the lens is not clear. Before their insertion they split up so as to pass immediately into the lens capsule as fine fibrillæ.

JUSELIUS (495, **The development of the posterior pigment epithelium of the iris from the secondary optic vesicle, and its relation to the musculature of the iris and to spontaneous iris cysts**) has traced the development of the sphincter pupillæ in a series of human embryos. Its development from the anterior ectodermal layer of the secondary optic vesicle begins, when the embryos are from 8 to 9*cm* long, from cells which lie near the place where the two ectodermal layers bend about the future pupillary opening. The change of the ectodermal layer into muscle appears to take place in a stage in which

the pigmentation is still incomplete. The change of the ectodermal layers into muscle and pigment epithelium begins at the base of the iris in the anterior layer and advances toward the margin of the pupil where the pigmentation passes over to the posterior layer.

SCHREIBER and SCHNEIDER (496, **A method for the demonstration of pigments and of their colorless precedents, with special reference to the pigments of the eye and skin**) show that the silver impregnation of Levaditi and Bertarelli is fitted not only to reveal melanotic pigments but also their colorless precedents (stroma cells of the fœtal iris) and possibly their colorless products (cells of the stratum spinosum of the skin). With this method they show: (1) the chromatophore stroma cells of the iris possess colorless as well as pigmented processes of protoplasm; (2) the differentiation of the colorless young forms of the chromatophore stroma cells from the mesenchym cells of the uvea is to be traced embryologically; (3) in the albinotic eye neither the stroma cells of the uvea nor the pigment epithelial cells of the retina show a disposition to formation of pigment; (4) the theory that slightly pigmented sarcomata are young forms of melanosarcomata is not confirmed; (5) Langerhans' cells of the skin are probably non-pigmented melanoblasts; (6) the cells of the nævus nests of the skin show no tendency to the formation of pigment.

GOEZ (497, **Study of lachrymal glands at different periods of life**) says that from the first decennium of life the histologic construction changes gradually, the height of the cells of the glandular epithelia becomes less and the lumen correspondingly larger; after forty years of age the interstitial tissue develops abundantly. A certain difference is recognizable between glands of men and of women as the latter are larger and the increase of interstitial tissue with advancing age is less marked.

VAN DUYSE (498, **Cyclopia with cryptophthalmos and colobomatous cyst**) observed in a human fœtus the coincident presence of cyclopia with cryptophthalmos and colobomatous cyst. The cyclopia was incomplete as the two eyeballs were united only in their posterior segments. The very thorough anatomic examination of this very rare malformation is not fitted for abstract. BERGER.

## V.—PHYSIOLOGY.

499. KLEIN, FR. **The pressure phosphenes do not depend on mechanical irritation of the rods and cones.** *Arch. f. Anat. u. Phys.*, Physiol. Section, p. 444.

500. KLEIN, FR. **The rubbing away of the pressure phosphenes and its importance in the theory of vision.** *Ibid.*, Supplement, p. 161.

501. KLEIN, FR. **After-images, hypermetropia, and nomenclature.** *Ibid.*, Supplement, p. 217.

502. KLEIN, FR. **The deforming fluctuations in size of after-images.** *Ibid.*, Supplement, p. 222.

503. BASLER, A. **The vision of movements.** Second part. *Arch. f. d. g. Phys.*, No. 124, p. 313.

504. V. MALTZEW, CATHARINA. **Individual difference in the light dispersion in the spectrum.** *Zeitschr. f. Sinnesphysiologie*, No. 43, p. 76.

505. FREUND, E. **Binocular vision.** *Ibid.*, No. 43, p. 1.

506. KOELLNER. **Monochromatic color system as reduction form of congenital dichromasia.** *Ibid.*, 43, No. 3, p. 163.

507. OHMANN, M. **An ophthalmologically interesting observation.** *Ibid.*, 43, No. 3, p. 241.

508. MAGITOT, A. **The early appearance of the photomotor reflex in the course of fœtal development.** *Annales d'ocul.*, cxl., p. 161.

KLEIN (499, **The pressure phosphenes do not depend on mechanical irritation of the rods and cones**) observed that pressure phosphenes can be removed by rubbing easily and for a considerable time in the dark, less easily and for a short time in the light. Hence he concludes that pressure phosphenes are not due to a direct mechanical action upon the rods and cones but to dissimilation of a substance. "A substance, a provision of which is present, is broken up. If the provision is consumed the rubbing produces no directly noticeable effect."

KLEIN (500, **The rubbing away of the pressure phosphenes and its importance in the theory of vision**) assumes as a corollary to the above hypothesis that this breaking up of a substance is intermittent, for so only could it produce nerve irritation. This intermittent process should be set up in the retina containing the visual cells, absorb the substance when of proper strength, but let it pass in the pauses and itself go on with light development.

KLEIN (501, **After-images, hypermetropia, and nomenclature**) denominates as after-images those which appear in the darkened eye after brief irradiation; $\beta$ after-images are those which

appear after fixation of a very bright object for 30 to 40″; *γ* after-images are those which are called forth anew by light or pressure after the spontaneous after-images have disappeared. In the *δ* stage no after-images are to be produced by pressure and only a faint one, if any, by light.

KLEIN (502, **The deforming fluctuations in size of after-images**) says that the after-images of quiet objects exhibit movements, becoming larger in the primary after-image, smaller in the secondary, and larger in the tertiary. These fluctuations in size Klein calls deforming because the different forms of the after-image are not geometrically similar. He assumes that other parts of the retina beside the rods and cones take part in the production of these fluctuations in size, that in pressure phosphenes and in after-images the process takes place in the retina in front of the layer of rods and cones.

BASLER'S (503, **The vision of movements**) second article deals with the perception of extremely slight movements with all objects for comparison excluded in a dark room. Then the lateral movement of a vertical slit *2mm* broad and *5mm* long is still perceptible when the movement of the retinal image equals *5.25mm*, corresponding to a visual angle of 1′ 15″. Hence the sensitiveness for motion is lessened fourfold when objects for comparison are excluded. In the dark the perception of movements continuously decreases from the fovea toward the periphery. As this decrease is more rapid than that of the cones in the retina it follows that there is no direct relation between the sensibility to movement in different parts of the retina and the number of cones. From three to five movements per second are best perceived. The blind spot is surrounded by a zone of reduced excitability from 3 to 5° broad, so that as the centre of the blind spot is approached the movement must be increased in order to be recognized. The overestimation of the excursion of the movement is far less than in experiments in the light; in the latter very slight movements are greatly overestimated, the excursions of which are not perceived in the dark.

V. MALTZEW (504, **Individual difference of the light dispersion in the spectrum**) confined her studies to the light dispersion in the long-waved portion of the spectrum in order to exclude the possibility of individual differences of light ab-

sorption by coloring of the media. She found not only a markedly lower degree of sensibility to red on the part of the red blind and the red anomalous, but also notable differences on the part of those with good color perception, partly in a relatively reduced sensibility to red, partly in one to green. In spite of the relative reduction of sensibility to red on the part of many normal persons there is a broad gap between these and the red blind, while the green blind is connected to the normal by a continuous series. The red components have a much greater part in the light dispersion than the green components.

FREUND (505, **Binocular vision**) when twelve years old had a rupture of the choroid of the right eye which resulted in a central scotoma. In binocular vision the scotoma was negative, in monocular, with right eye, positive. When the visual fields of the two eyes were separated by a vertical partition, a colored surface held before the left eye and a white one before the right, the scotoma appeared in the color seen by the healthy left eye. This observation taken with others already known indicates the intimate connection of the two eyes in the common single visual field. It is analogous to Fechner's paradoxical experiment in which the placing of a gray glass before one eye causes a darkening of the visual field, while the complete occlusion of that eye causes a brightening.

KOELLNER'S (506, **Monochromatic color system as reduction form of congenital dichromasia**) observation was made on a patient with aphakia of one eye and an incipient cataract in the other. In the aphakic eye, the vision of which with correction was $\frac{1}{2}$ to $\frac{3}{5}$, there was a little atrophic spot in the chorioid near the fovea. One eye showed a dichromatic color system (deuteranope according to v. Kries), the aphakic eye maintained an analogous condition in the large visual field with a little (2–3°) monochromatic color system present, the light dispersion of which agreed with the red components of the deuteranopic system. The observation forms a counterpart to the case of Koenig's, in which congenital protanopia became associated with acquired violet blindness through detachment of the retina.

OHMANN (507, **An ophthalmologically interesting observation**) observed during fixation of a dark object with the source

of light, like the setting sun, above the point of fixation a secondary image of the source of light in the form of a weakly illuminated circular surface below the point of fixation. He explains this image as the perception of the light reflected from the cornea.

MAGITOT (508, **The early appearance of the photomotor reflex in the course of fœtal development**) demonstrated in a fœtus five months old contraction of the pupil to light, which he explains through the development of the visual cells, the oculomotor nucleus, and the sphincter pupillæ. As in a fœtus five months old the optic fibres have no medullary sheaths, Flechsig's view that the latter are necessary to the conductivity of the nerve fibres is incorrect. BERGER.

## VI.—REFRACTION AND ACCOMMODATION.

509. v. REUSS. **The visual capacity of hypermetropes.** *Archiv f. Ophthalm.*, 69, No. 1, p. 106.

510. SEGGEL. **Myopia and the light sense.** *Klin. Monatsbl. f. Augenh.*, xlvi., ii., p. 436.

511. LAFON, CH. **A case of curvature hypermetropia of high degree.** *Recueil d'ophtalmologie*, xxx., p. 19.

512. ALEXANDER, G. F. **The corelation of conjugate to principal foci in lenses.** *Ophthalmic Review*, August, 1908.

513. DUANE, ALEXANDER. **An attempt to determine the normal range of accommodation at various ages—being a revision of Donders's experiments.** *Trans. Amer. Ophthalmol. Soc.*, 1908.

514. THOMSON, E. S. **Some clinical aspects of lenticular astigmatism.** *Jour. Amer. Med. Assn.*, July 25, 1908.

v. REUSS'S (509, **The visual capacity of hypermetropes**) studies were directed to the question what degree of absolute hypermetropia renders a person unfit for railroad work, in which a vision without glasses of at least $\frac{6}{18}$ is necessary. He divided 1400 hypermetropes with vision of $\frac{6}{6}$ into three groups: (1) visual capacity without glasses of $\frac{6}{24}$ or less; (2) visual capacity of $\frac{6}{18}$ to $\frac{6}{8}$; (3) visual capacity of $\frac{6}{6}$. With hypermetropia of 1 D. group 1 is observed only after the 60th year; group 2 is quite frequent. Hypermetropia of 2 D. furnishes a large contingent to group 1, while group 2 takes about 8%. With hypermetropia of 3 D. perhaps half have a visual capacity without glasses of less than $\frac{6}{18}$. Consideration of the age shows that the manifest hypermetropia in many cases with

normal vision and sound eyes becomes partially absolute in early life, before thirty years of age, and the visual capacity sinks below the normal, even when the hypermetropia is of low grade. In women the hypermetropia becomes absolute much earlier than in men, so that their visual capacity sinks below normal earlier and to a greater degree. At the railroad examination hypermetropes of more than 2 D. should be excluded, because in ⅓ of them an insufficient vision without glasses is to be feared with the lapse of years.

SEGGEL (510, **Myopia and the light sense**) found 175 myopes among 506 students, the majority of which showed a reduction of the light sense when compared with hypermetropes and emmetropes.

LAFON (511, **A case of curvature hypermetropia of high degree**) reports a case of hypermetropia of high degree induced by a slight corneal opacity in a six-year-old boy. The vision of both eyes was bad and there was strabismus of the left. Retinoscopy showed hypermetropia of 14 D. in the horizontal and 15.5 D. in the vertical meridian of both eyes; the radius of curvature of the horizontal meridian was 10.5*mm*, that of the vertical 11.39*mm*. The vision of the right eye was ⅓ with −14 D., that of the left could not be improved with glasses. In both eyes there was an opacity of the peripheral zone of the cornea (embryotoxon Welker's). BERGER.

ALEXANDER (512, **The corelation of conjugate to principal foci in lenses**). The ordinary demonstrations are cumbrous, and in many cases the formula is deduced from one still more intricate. The author utilizes the deviation of a prism. The paper is a short one of three pages only, but any abstract which did not reproduce the two diagrams would be unintelligible. It is a matter of purely academic interest.

T. HARRISON BUTLER.

The series examined repeatedly and most carefully by DUANE (513, **An attempt to determine the normal range of accommodation at various ages—being a revision of Donders's experiments**) includes 390 cases, while Donders's conclusions are drawn from about one-third of that number. Duane offers his conclusions and variations as tentative only and concludes that accommodation in childhood and youth is not so high as stated, rarely being above 14 D. (Donders's 18). Between

ten and fourteen there is little diminution and the maximum may possibly be reached at sixteen to eighteen. Accommodation often shows a period of years when there is little change followed by a rapid fall. Two periods of apparent stasis are seen between 25 and 30 and 35 and 40. From 41 to 51 the line of curvature falls rapidly—a drop of 4.4 D. as against 3.4 D. in the preceding eleven years. After 51 accommodation remains nearly constant. A single determination of the power of accommodation is of little value owing to the variations in any case at certain times. ALLING.

THOMSON (514, **Some clinical aspects of lenticular astigmatism**) in the study of his refraction cases considers: (1) corneal astigmatism; (2) lens astigmatism, (*a*) static, (*b*) dynamic; (3) degree of compensation; (4) the factor in the error which produces the symptoms. He employs the ophthalmometer to determine the corneal curve and the shadow test for the total astigmatism. The difference between the two represents the lenticular. Regarding compensation of the corneal error by the lens he favors the theory of partial contraction of the ciliary muscle, although the modification by this means must be small. He discusses the bearing of the lenticular element in each of the various clinical forms of astigmatism. The paper is one of especial merit. ALLING.

## VII.—MUSCLES AND NERVES.

515. CALLAN, P. A. **Strabismus from the operative standpoint.** *Trans. Amer. Ophthalm. Soc.*, 1908.

516. REBER, W. **Some facts concerning family exophoria.** *Ophthalmic Record*, Dec., 1908.

517. OHM, J. **The absolute localization in a case of rotation strabismus.** *Centralbl. f. prakt. Augenheilkunde*, xxxii., p. 194.

518. CASPAR, L. **A case of hereditary nystagmus.** *Ibid.*, p. 194.

519. WESTHOFF. **Ophthalmoplegia totalis duplex.** *Ibid.*, p. 356.

520. KRAUS, K. **Traumatic paralyses of the ocular muscles after injuries to the skull.** *Inaug. Dissert.*, Tuebingen, 1908.

521. RICCHI, G. **Paralysis of the sixth pair after novocainization.**

522. PASCHEFF, C. **The tumors of the extrinsic muscles of the eye.** *Annales d'ocul.*, cxl., p. 249.

523. SEBILEAU, PIERRE, and LEMAÎTRE, FERNAND. **Reflex mechanical nystagmus from a plug of cerumen.** *Ibid.*, p. 181.

524. GALEZOWSKI, J. **Congenital unilateral paralysis of abduction with enophthalmos and diminution of the palpebral fissure.** *Soc. d'ophtalmologie de Paris*, March 2, 1909.

525. NUEL, J. P. **Miners' nystagmus.** *Soc. Belge d'ophtalmologie*, April 26, 1908.

526. DRANSART and FAMECHON. **Miners' nystagmus from a medico-legal point of view. Errors to be avoided in the medico-legal examinations called for by accidents among miners.** *Ibid.*, April 26, 1908.

CALLAN (515, **Strabismus from the operative standpoint**) avoids tenotomies, especially during the growing period, but operates by muscle resection, if six months' use of glasses and orthoptic training show no results. His method is practically that of Reese. After the conjunctival incision the muscle is freed and raised on hooks. A thread with two needles is looped into the muscle which is then cut off as the case demands. The threads are then passed through the stump of the tendon, about 1*mm* of which is left. Supplementary sutures are sometimes used. ALLING.

REBER (516, **Some facts concerning family exophoria**) began his investigations with the belief that the direction of the visual axes was to a considerable degree dependent upon the peculiarities of the cranial build. He thinks that dolichocephalus (long skull) predisposes to exophoria. A study of his tables is not convincing. ALLING.

OHM'S (517, **The absolute localization in a case of rotation strabismus**) patient was a boy 10½ years old who had been operated on for convergent strabismus and after the operation still showed a combination of convergent strabismus with marked rotation deviation of the left eye, the upper end of the vertical meridian inclined to the left. He described three apparent vertical directions, one dependent on the right eye almost perpendicular, and two dependent on the left eye, one when the right eye was open, deviating greatly from the true perpendicular, the other when the right eye was closed, deviating less. By means of after-images it was shown that at the moment of the closure of the lids of the right eye the originally oblique vertical meridian very nearly approached the perpendicular. Thus the change of the localization of the apparent vertical direction is explained by the change of the rotation innervation. Analogously three subjective median planes were demonstrable corresponding to the horizontal squint, but as these differences of median local-

ization cannot explain the rotation, "its cause remains dark."

CASPAR (518, **A case of hereditary nystagmus**) observed a man 31 years old who had suffered from nystagmus and bad vision since very early life. The fundus was normal except for a marked atrophy of the chorioidal pigment. The family history showed that the condition had been transmitted through the grandmother, or parents on the mother's side, almost without exception to the male descendants, while the female descendants escaped.

WESTHOFF (519, **Ophthalmoplegia totalis duplex**) observed a case of bilateral total ophthalmoplegia associated with paresis of the motor bundle of the third branch of the trigeminus which came on during the course of an infectious disease (typhoid fever?) and recovered after the lapse of several months.

KRAUS (520, **Traumatic paralyses of the ocular muscles after injuries to the skull**) reports 38 cases in which traumatic paralyses were occasioned by indirect lesions of the nerves supplying the ocular muscles within the cavity of the skull. The oculomotorius was affected alone 5 times, the abducens 12 times, the trochlearis 9 times; the oculomotorius and abducens were affected together once, the oculomotorius and trochlearis once, the optic nerve and oculomotorius twice, the optic nerve and abducens three times. There were also complications on the part of the facialis, acusticus, and trigeminus. The special frequency of the abducens paralysis cannot be well explained by the theory of a nuclear or cortical lesion, but is easily understandable from the long course of the nerve within the skull, particularly as it winds around the petrous portion of the temporal bone, the apex of which is so often the seat of the fractures of the base, and passes freely through the cavernous sinus.

RICCHI (521, **Paralysis of the sixth pair after novocainization**) observed in a woman 63 years old, two days after the use of novocain for lumbar anæsthesia, the onset of a paralysis of the right abducens which showed only a slight improvement after the lapse of twenty days. He thinks this paralysis was of a toxic nature, and that the abducens is particularly exposed to the action of the toxic substances

circulating in the blood during its passage through the cavernous sinus, where it is surrounded by blood. This likewise explains why the abducens is the nerve most frequently paralyzed after lumbar anæsthesia with stovain, cocain, or novocain. BERGER.

PASCHEFF (522, **The tumors of the extrinsic muscles of the eye**) describes the following cases of tumors of the extrinsic eye muscles: (1) alveolar sarcoma of the superior rectus secondary to an intra- and epibulbar sarcoma in a girl 14 years old; (2) lipoma of the superior rectus in a girl 14 years old; (3) cysticercus cellulosæ in a woman 24 years old. He has collated also all the cases of tumors of the extrinsic eye muscles hitherto described. BERGER.

SEBILEAU and LEMAÎTRE (523, **Reflex mechanical nystagmus from a plug of cerumen**) report a case of horizontal nystagmus in a man 41 years old caused by a plug of cerumen in the external auditory canal of the same side. They assume that the plug affected the membrana tympani mechanically and acted through this upon the ossicles and labyrinth so that the result was one of mechanical irritation of the labyrinth.

BERGER.

GALEZOWSKI (524, **Congenital unilateral paralysis of abduction with enophthalmos and diminution of the palpebral fissure**) observed in a woman 20 years old enophthalmos of the left eye with diminution of the papebral fissure and immobility of the eye outward. During the movement of the eye inward the enophthalmos and the contraction of the palpebral fissure increased. The cause of these phenomena was, he thinks, a congenital absence of the external rectus, or a transformation of it into a cicatricial cord. BERGER.

NUEL (525, **Miners' nystagmus**) claims that apparent movements of objects is present only with acquired nystagmus, never with congenital; when the nystagmus is of long standing, the apparent movements are likewise wanting. The vision falls during the oscillations to $\frac{1}{6}$, $\frac{1}{12}$, or even less. In many miners the nystagmus is present only when the body is stooping or lying down. Looking upward and the need of using the circumfoveal zone of rods of the retina play a part in the pathogenesis of nystagmus. BERGER,

DRANSART and FAMECHON (526, **Miners' nystagmus from**

**a medico-legal oint of view. Errors to be avoided in the medico-legal examinations called for by accidents among miners**) observed the presence of clonic blepharospasm in severe cases of miners' nystagmus, in which the spastic contractions of the orbicularis were synchronic with the nystagmic oscillations, were increased by weariness, light, movements and closure of the lids, and were associated in the majority of cases with blepharoptosis. In the severe cases of nystagmus there was a great reduction of the visual acuteness and probably also hemeralopia. BERGER.

Sections VIII.–XII. Reviewed by DR. SCHWEIGGER, Berlin.

VIII.—LIDS.

527. SNELL, SIMEON. **Streptococcal infection of the eyelids treated by antistreptococcal serum.** *British Medical Journal*, July 4, 1908.

528. SPRIGGS, N. I. **An epidemic of influenza characterized by œdema of the eyelids.** *British Medical Journal*, Dec. 12, 1908.

529. SYM, W. G. **A case of partial ptosis with exaggerated movement of the affected eyelid: the "jaw winking" phenomenon.** *Ophthalmic Review*, July, 1908.

530. THEOBALD, SAMUEL. **A simplification of de Grandmont's operation for ptosis.** *Trans. Amer. Ophth. Soc.*, 1908, and *Bulletin of the Johns Hopkins Hospital*, Nov., 1908.

531. FRANCKE, N. **Noma of the lids.** *Klin. Monatsbl. f. Augenheilk.*, xlvi., ii., p. 432.

532. STOEWER, P. **A case of partial gangrene of the lid with subsequent hemorrhagic diathesis.** *Ibid.*, p. 63.

533. LAPON, CH. **Etiology of chalazion.** *Arch. d'ophtalm.*, xxviii., p. 693.

534. COSMETTATOS, G. F. **Fibromatous transformation of a chalazion.** *Archives d'ophtalmologie*, xxix., p. 102.

535. GOLDZIEHER, W. **Senile spastic entropion.** *Klin Monatsbl. f. Augenheilkunde*, xlvi., ii., p. 426.

SNELL (527, **Streptococcal infection of the eyelids treated by antistreptococcal serum**) reports a case of general streptococcal invasion starting from a suppurating sebaceous cyst under the left eye. This infected both eyelids, and general toxæmia followed. A streptococcus was found in large numbers in a smear preparation. Antistreptococcus serum was injected, and the patient made a good recovery.

T. HARRISON BUTLER.

SPRIGGS (528, **An epidemic of influenza characterized by œdema of the eyelids**) has collected about 50 cases in which influenza was preceded by œdema of the lids. The condition is omitted in most works upon the disease, but is noticed by Finkler of Bonn, who states that abscess formation is a frequent sequela. Spriggs has only seen this once, nor does he find that œdema follows the attack as Finkler states; it is an early symptom. It is generally associated with severe frontal headache. The prognosis is good.

T. HARRISON BUTLER.

SYM (529, **A case of partial ptosis with exaggerated involuntary movement of the affected eyelid: the "jaw winking" phenomenon**). The patient at rest showed slight ptosis of the left eye, but as soon as she began to eat or sing the left lid was drawn up forcibly, disclosing *3mm* of white sclerotic above the corneo-scleral junction. Two photographs make the condition plain. T. HARRISON BUTLER.

THEOBALD (530, **A simplification of de Grandmont's operation for ptosis**) has improved this operation by making parallel incisions through the tarsus from the inner side, avoiding a skin incision. Resection is very easily made by this method. Very fine sutures are used and do not cause irritation.

ALLING.

FRANCKE (531, **Noma of the lids**) reports a case of gangrene of the lids in a child four weeks old who was in a miserable condition. Its origin could be traced to neither ectogenous nor endogenous infection. He bases the diagnosis of noma of the lids upon the fact that this disease is prevalent among badly nourished children in cold damp rooms in winter along the shores of the Baltic. These etiological conditions were present in this case. The recovery was excellent, only a slight ectropion of one of the lower lids remaining. The bacteriologic examination gave a negative result. K.

STOEWER (532, **A case of partial gangrene of the lid with subsequent hemorrhagic diathesis**) met with a case of this kind in a child 3 years old. The child had a slight ulceration of the margin of the lid followed by gangrene associated with large diffuse hemorrhages from the entire conjunctiva. General septic symptoms then appeared with extensive subcutaneous hemorrhages in the ear and back and submucous hemorrhages

of the tongue. The disease ran a favorable course; the general condition improved rapidly after a few days and the affection of the lid recovered after the necrotic piece of tissue had been thrown off, leaving a slight cicatricial notching of the margin. The picture was that of the morbus maculosus Werlhofii. Bacteriologically only the staphylococcus aureus was found. A few weeks before the appearance of the lid trouble the child had had a severe attack of measles. Hæmophilia was not demonstrable.

LAFON (533, **Etiology of chalazion**) has sought to determine the etiology in about 100 cases of chalazion and found very frequently gastro-intestinal disorders, constipation, and, in women, menstrual disturbances. In many cases the chalazia appeared chiefly during pregnancy or the climacteric. In addition to the local treatment the treatment of the general condition is indicated in every case. BERGER.

COSMETTATOS (534, **Fibromatous transformation of a chalazion**) removed a chalazion as large as a hazel-nut from the left lower lid of a patient 31 years old and found that it presented the anatomical peculiarities of a fibroma. The granulation tissue and giant cells in the tumor showed that it had originally been a chalazion which had undergone transformation into a fibromatous tumor. BERGER.

GOLDZIEHER (535, **Senile spastic entropion**) describes a new operation for senile spastic entropion. He starts with the fact that this condition is caused by great laxness of the skin of the face which can no longer maintain the necessary counterpoise to the tendency of Riolani's muscle to turn the edge of the lid in. He seeks to shorten the skin of the lid by means of excision of a piece of the skin of the cheek. His method is a modification of Busch's operation. An isosceles triangle is marked out, its base 1 or *2cm* long extending from the outer canthus slightly outward and downward; upon this the isosceles triangle is erected, pointing inward and downward, the enclosed skin is excised and the two sides are united by sutures. The operation, performed under local anæsthesia, gave good results in all cases. K.

(*To be continued.*)